

SEPTEMBER, 1960

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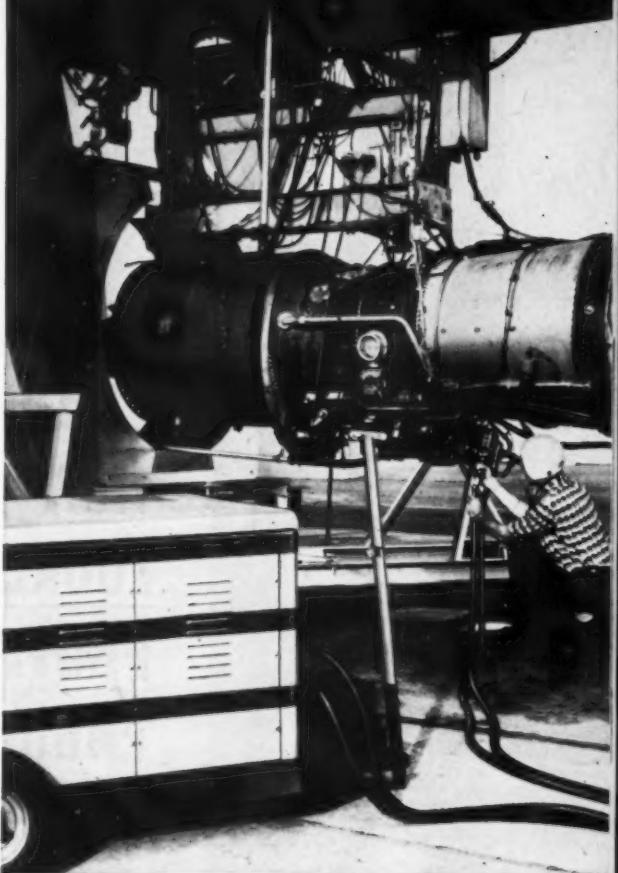
CAPABILITY

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Auxiliary power units pioneered for aircraft turbine starting by Vickers combine high efficiency with minimum size and weight for the power delivered. Because starter characteristics are closely matched to engine requirements, they provide smooth, steady acceleration of the engine through the firepoint range giving the best possible chance of proper "lighting off" and avoiding aborted starts.

Dual-purpose units developed by Vickers as an outgrowth of pioneering work in hydraulic starting offer further benefits in weight saving. These units are used as a motor in engine starting, as a pump to supply accessory power during normal operation. Reduced cost and ground support requirements plus increased versatility and simpler remote area operation are other major benefits. Write for Bulletin A-6001.

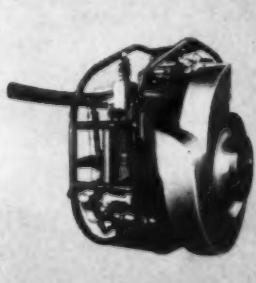
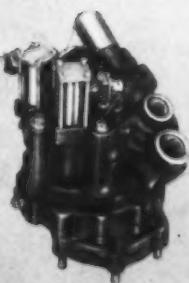


PROVED PERFORMANCE of hydraulic starting for jet engines is demonstrated by this cart that has performed more than 2,500 trouble-free starts in a 2-year period. Cart size is due to divergent requirements of three different engines. Prime mover power requirement is only 25% of that needed for other starting methods due to inherent high efficiency of the hydraulic transmission.



JET PROP STARTING demonstration uses engine-mounted starter motor and ground cart power supply. Starter cutout speed of approximately 8,000 rpm was reached in 34.5 to 40 seconds during series of observed test starts.

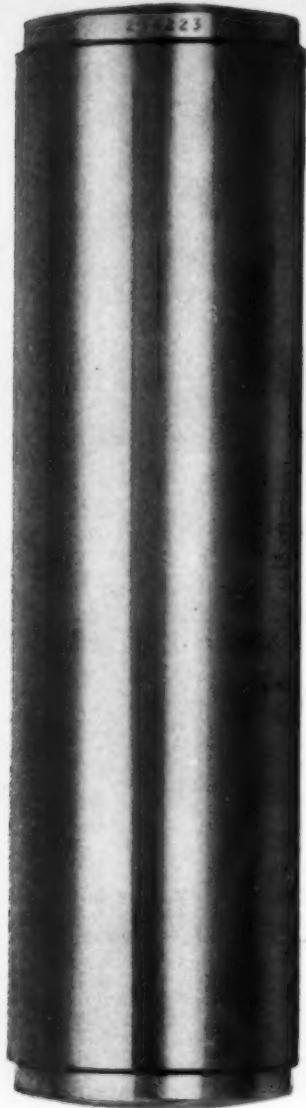
MULTI-PURPOSE PUMP MOTOR (left) is pump when driving hydraulic starter becomes motor during normal flight to drive 15 KVA generator. **HELICOPTER STARTER** (right) is 35 hp unit, starts 1,900 shaft hp engine readily.



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TORRANCE, CALIFORNIA

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CORPORATION

POWER TRANSMISSION
ENERGY CONVERSION
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HOW A PISTON PIN THAT LOOKED LIKE THIS PROVED ENGINES ARE SMARTER THAN SOME PEOPLE



An overhauled R-985 engine was being shop-tested. During the check-out a new piston pin failed. Damage to the power section was extensive... expensive, too. Rods and pistons were broken. Although the fractured pin might have *looked like* a Pratt & Whitney Aircraft original equipment part, the engine soon detected its invisible defect.

The steel in the look-alike pin lacked sufficient hardness. Its specification had long since been discarded by Pratt & Whitney Aircraft engineers. Through continuous research, experiment, redesigning and testing, a steel better able to cope with extremes in wear and fatigue had been specified.

Such incidents are not uncommon. They only prove that engines are smarter than some people. So it makes good sense to depend on Pratt & Whitney Aircraft *original equipment parts*. They are dependable, compatible and economical — quickly available from the company and its authorized distributors in the United States and Canada.



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WORLD AIR TRANSPORTATION

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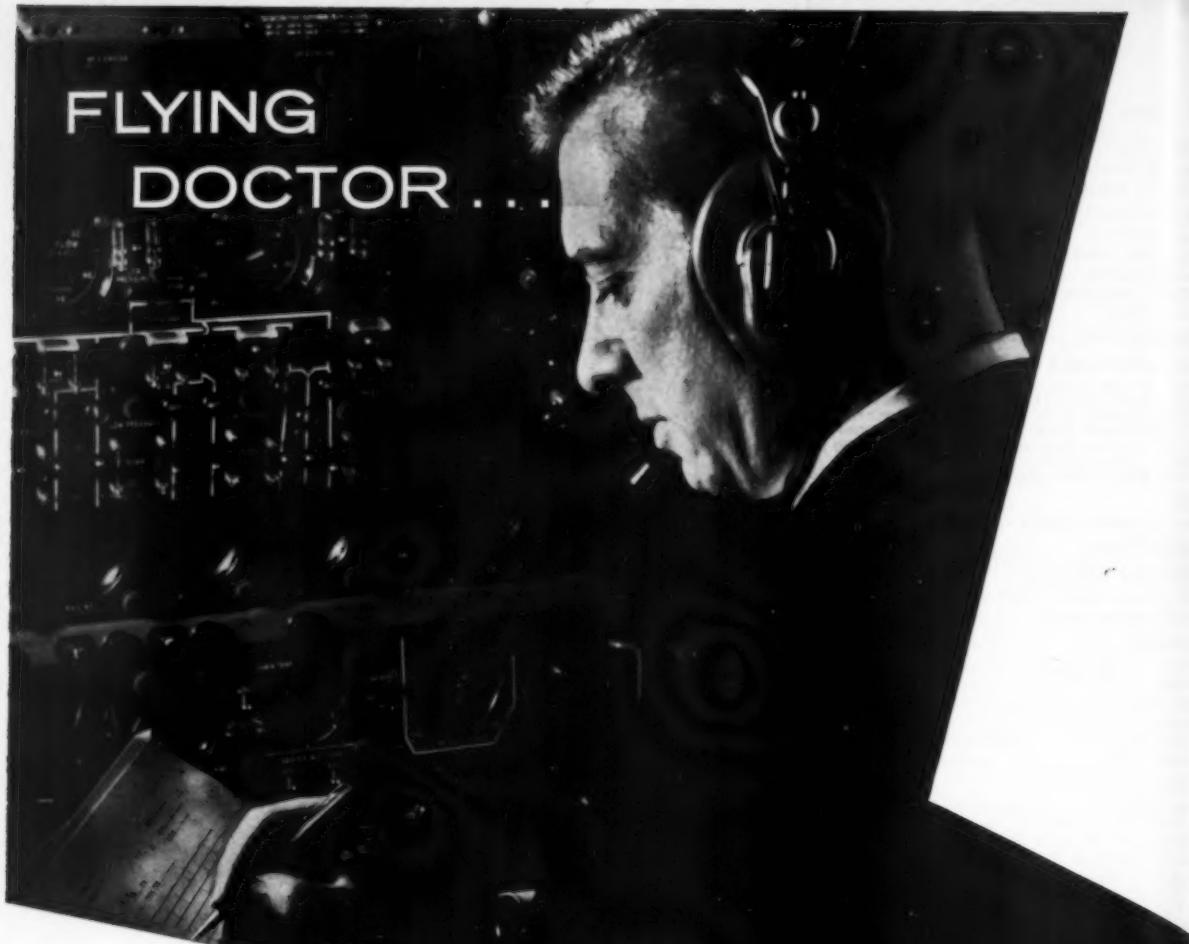
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THIS MONTH'S COVER—The Dulles airport mobile lounge is the newest thing in air transportation that is not an airplane and FAA Administrator E. R. "Pete" Queada unquestionably is one of the few men with the power to put across so original an idea. Appearing outwardly as an oversized milkwagon of the 1920's, it could prove the much-needed answer to airport efficiency in the 1960's. For details, see page 28.

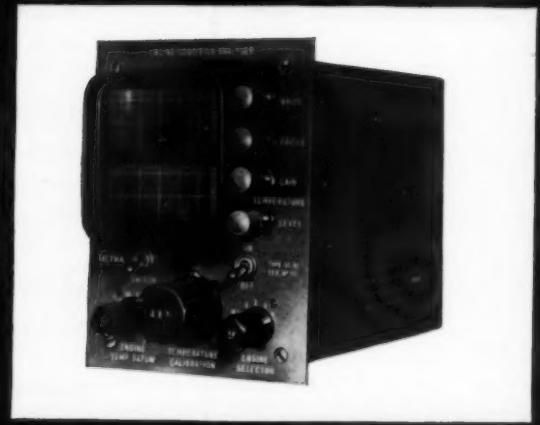
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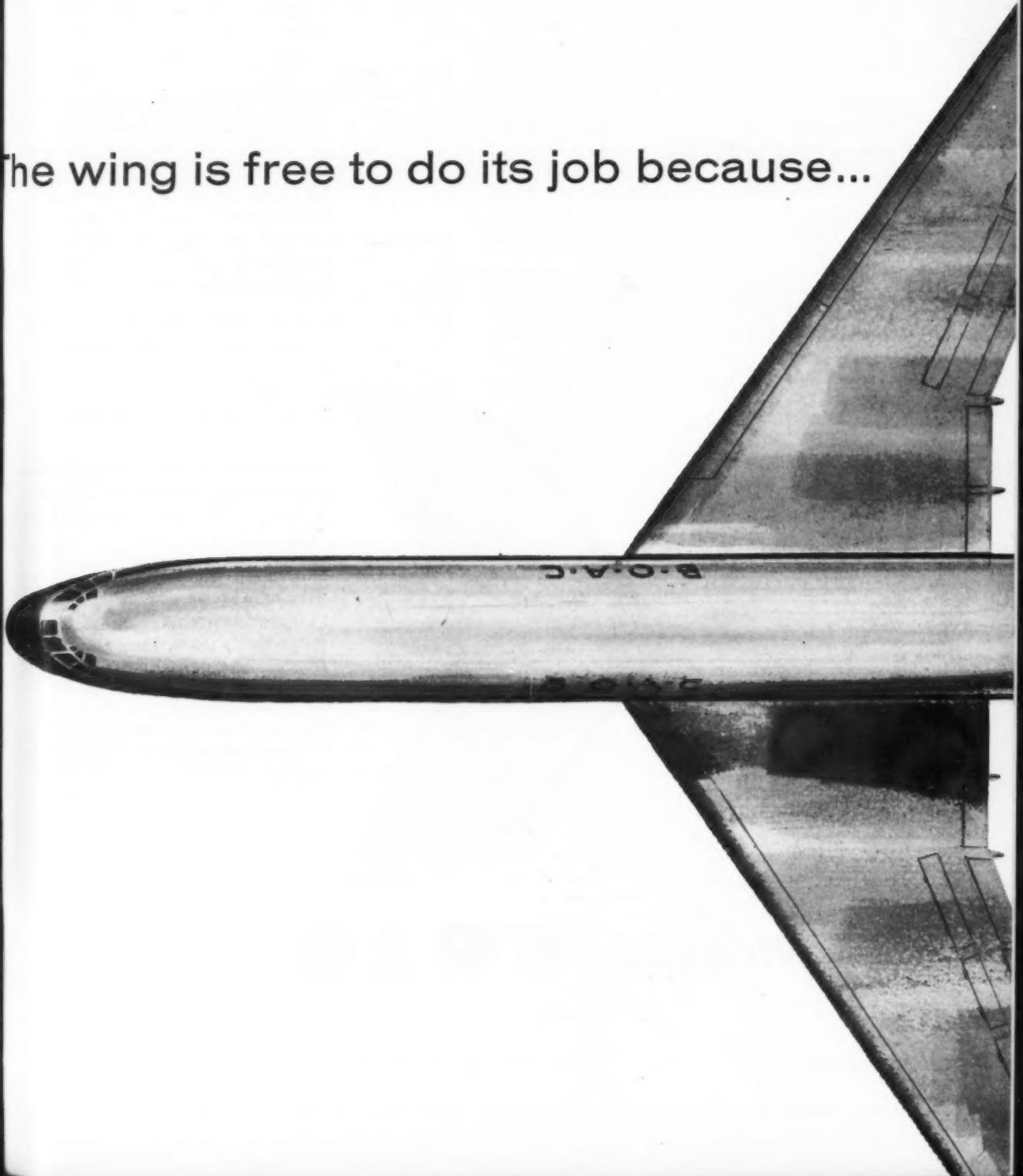
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- **CLEAN WING FLIGHT** is the flight of the future. It will be required from all modern airlines in their second-generation jet transports.

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CLEAN WING FLIGHT represents an aerodynamic breakthrough, every aspect of which will be found in the Vickers VC10.

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VICKERS **VC 10**



Four rear-mounted Rolls-Royce Conway By-Pass Turbojets

Vickers-Armstrongs (Aircraft) Ltd., Weybridge, England • Member Company of British Aircraft Corporation



Momentous Decisions

HOW MANY TRUNK AIRLINES should there be in the United States? There are now twelve. Two merger proposals are in the works. More are coming.

No greater decisions have ever faced the CAB than the current evolutionary cycle of the trunks. Granted that there are impelling economic reasons for absorbing a few of the smaller trunks, where does the elimination trend stop.

Unless the CAB is most awfully careful, it might well approve a revised network so imbalanced in control of traffic that the ultimate survivors may number closer to four or five rather than the eight presently indicated. And is it in the public interest to have that kind of a trunk pattern? Is mere bigness the sole justification for airline service throughout a large country?

Somewhere along the line—and not very far away—the CAB must ponder well not only the impact of merger proposals now out in the open, but those which are fairly well indicated in the near and intermediate future. By this we are not implying approval or disapproval of those in the works. What we are saying is that the decisions facing the CAB are momentous and historic and there will be no turning back once the pattern is established.

Is the U.S. Really Serious?

THE DEPARTMENT OF STATE has given indications that it wants to reverse its traditional foreign air policies and start applying capacity restrictions based on origin and destination of passengers.

Up to now the U.S. has not only been liberal in supporting unlimited schedules and a maximum of concessions in the direction of freedom of the air, but in the opinion of many in the U.S. it has actually gone to unnecessary extremes in granting rights without adequate reciprocity.

A test case seems to be in the wind with the upcoming U.S.-Scandinavia bilateral talks. For the first time the U.S. wants to consult on capacity, meaning that it may propose to restrict and possibly reduce the number of Scandinavian Airlines flights unless SAS can show that Scandinavia is actually the origin and destination point for much of its traffic.

We don't believe this new U.S. position will be successful, but more than that, we question the wisdom of initiating the idea in the first place. International traffic will be determined by service and convenience to the public, plus competitive salesmanship. Arbitrary restrictions, as practiced in various parts of the world, are negative and defensive.

The proper place to examine the problem, if one exists, is in the area of service and of efforts be-

ing made to compete. Capacity restriction is a disease which is difficult to stop from spreading.

The Brancker Affair

THE PEREMPTORY FIRING of John Brancker as traffic director of the International Air Transport Association has had widespread repercussions around the world and the last is not yet heard of it. Almost certainly it will be the subject of talk and possible action at the annual general assembly of the world's airlines in Copenhagen in mid-September.

Why was Sir William Hildred so desperately anxious to oust Brancker, whose sins, whatever they are or were, could not well match his knowledgeable assets to IATA? Why did Sir William spring the demand on the IATA executive committee with an absolute finality as a test of his own leadership?

Sir William has been director general since 1945. He is now 67. It was generally understood, although not in writing, that he would retire at age 65. John Brancker was brought into IATA in 1953 after long experience in airline traffic with an understanding—again not in writing—that if everything went well he was a logical successor to Sir William. If Sir William is finally getting ready to retire—belatedly—this is good news. It would seem that he has deep feelings against his colleague and wanted to sink him first. A nasty business throughout. The truth is that Sir William has outlived his usefulness to IATA and world air transportation. Everybody seems to know this except him.

Encouraging Trend

THERE IS A SIGNIFICANT "NEW LOOK" at the Civil Aeronautics Board these days. Three new members, including a chairman who is making an impressive record for making decisions and keeping things humming, have given the Board new and different character.

Two activities recently launched are much to the Board's credit. One is a management study now being completed by an independent consultant firm under direction of the Bureau of the Budget. Another is a long range planning study being conducted internally. Without taking credit from former members who advocated such activity, it can be said that the new chairman, Whitney Gilliland, is impressing observers with his administrative talents and ability to operate a busy shop. He is a man on the go.

So far it all looks very good. It could be the best CAB in many years.

Wayne W. Parish

LIFT AND THRUST FROM ONE ENGINE

A single power source for VTOL and STOL aircraft. The new Bristol Siddeley BS 53 high-ratio turbofan represents a major engineering breakthrough in the field of VTOL and STOL aircraft propulsion because it provides the airframe designer with a single power source for all conditions of flight.

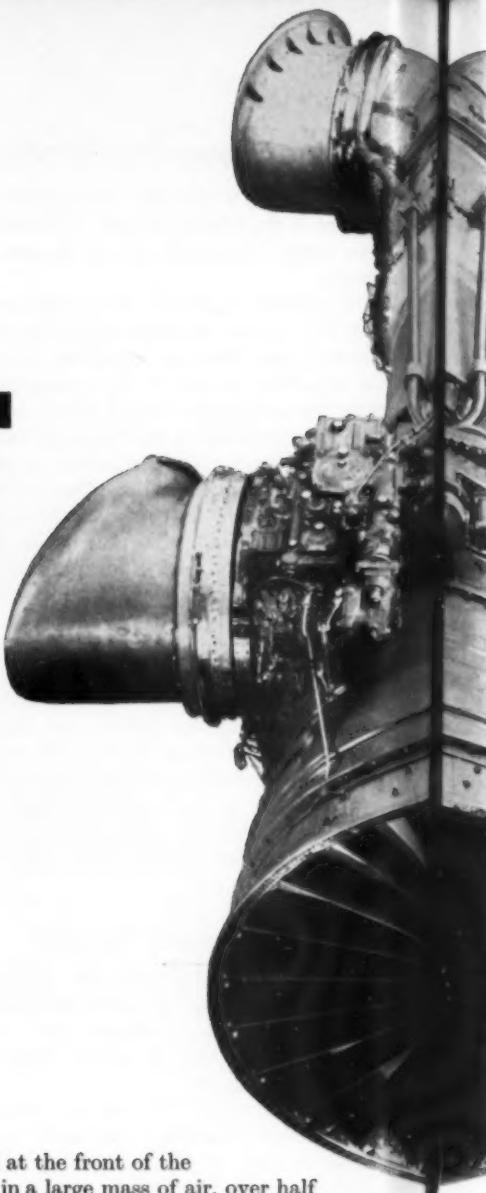
VTOL, STOL and normal take-off capability. The most revolutionary feature of this unique engine is that the thrust can be evenly applied around the centre of gravity through four movable nozzles which are directed downwards for lift, backwards for thrust, forwards for braking in flight, or in any intermediate direction. This makes possible, for the first time, the design of single or multi-engined aircraft in which the total installed thrust is available for vertical or short take-off with a normal payload or for conventional take-off with a large overload.

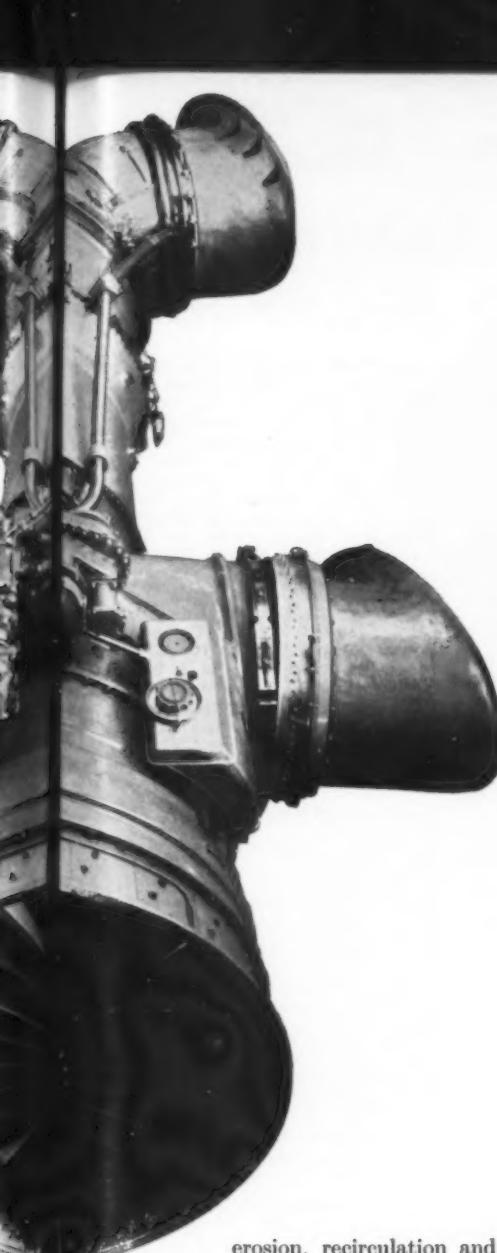
High cold-flow ratio, high thrust, low fuel consumption. The BS 53 is a high-thrust engine and the basic design concept which makes its versatile performance possible is a high cold-flow ratio.

A fan, located at the front of the engine, draws in a large mass of air, over half of which by-passes the main engine and is ejected in the form of a cool, relatively slow-moving stream through the two forward nozzles. The remainder passes through the gas generator and supplies thrust to the two rear nozzles. This arrangement greatly improves the Froude efficiency and gives the BS 53 a higher thrust/weight ratio, a lower specific fuel consumption and a lower noise level than any turbojet of comparable power in existence today.

Conventional installation, operational simplicity. The BS 53 is installed normally, with forward-facing intakes and the majority of its components are based on well-known principles already proved in service. These factors make for operational simplicity, easier maintenance, greater reliability.

Reduced problems of ground erosion and recirculation. Because the velocity and temperature of its jet effluxes are low, the BS 53 minimises the problems of ground





THE REVOLUTIONARY **BS 53** **TURBOFAN**

erosion, recirculation and ingestion of debris which are a major difficulty with fixed lifting engines. All ground running can be done with the exhaust discharging backwards like a conventional turbojet. Taxying also is perfectly normal, and at take-off a short forward roll before the nozzles are deflected downwards ensures that all debris is left behind. As a result, the BS 53 does not require prepared sites and is *independent of all fixed ground installations.*

Selected for the world's first VTOL fighter. The Bristol Siddeley BS 53 has received the support of the Mutual Weapons Development Programme for NATO, and has already been selected for the world's first fixed-wing, aircraft designed for operational service with V/STOL capability—the Hawker P 1127. Although this remarkable engine was primarily designed for this type of aircraft, it is equally suitable for any single or multi-engined, subsonic or supersonic aircraft which requires VTOL or STOL capability.

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LETTERS

Payscale Rebuttal

To the Editor:

For the sake of injecting some fact instead of fiction in your article on page 35 of Feb. *AIRLIFT* concerning pilot pay scales: I happen to be a 4-year captain with a "U. S. Airline"; member of ALPA, etc., and my salary was \$1,056 which is less than your quoted \$1,121 minimum. I am not alone in this lower scale either, if someone would check.

Name withheld
Airline Captain
San Antonio

Ed. Note: The compilation of average salaries was prepared by the International Federation of Airline Pilots Assn., not *AIRLIFT*. (See story, page 26.)

'Ceonite' Takes Hold

To the Editor:

Thank you for forwarding the inquiries about our new synthetic aircraft fabric, (*AIRLIFT*, Jan. p. 65), which carries the trademark "Ceonite."

"Ceonite" is well known in Southern California and is rapidly supplanting cotton. California dealers who operate fabric shops are quoting the same contract price for a "Ceonite" covering as for a cotton job. At present we have "Supplement Type Certificates" for 42 different types of airplanes with approximately 10 more pending.

DANIEL A. COOPER, President
Cooper Engineering Co.
Van Nuys, California

Another 'Airbus' Booster

To the Editor:

Welcome to the ranks of agitators for the cheap fare "Airbus."

For a long time now our Vanguard advertisements have proclaimed that "The Longest Queues are for the Cheapest Seats," and this has been profitably proved over and over again by BEA and other European operators on routes where they are free to charge fares which attract a whole new strata of the public.

An analysis of U.S. travel statistics (New York Times) showed that in 1959 only 7% of the U.S. traveling public used domestic airlines, and, of that 7%, a 15% "expense account" segment accounted for 64% of the trips.

There is only one way healthily to expand this minority industry, and that is by "Airbus" fares—hence our obstinate insistence on turboprops like the Vanguard for short and medium haul routes.

CHARLES GARDNER
Publicity Manager,
British Aircraft Corp.
Weybridge, Surrey, England

BOOKS

The Internal Combustion Engine in Theory and Practice: Volume I, Charles Fayette Taylor; The Massachusetts Institute of Technology and John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y. Volume I of this work is devoted to establishing a quantitative background for new design and development, and covers thermodynamics, fluid flow

and performance. Volume II, still in preparation, will encompass fuels, combustion, materials and design. The two-volume set is aimed at the design engineer, and contains a wealth of engineering data.

The World Aloft, Guy Murchie; Houghton Mifflin Co., Boston, Mass. Navigator Murchie's "Song of the Sky" was a Book-of-the-Month Club selection in 1954. "The World Aloft" is based on the earlier work but is concerned more with the factual aspects of the subject than the philosophical. Delving into the eternal mysteries of winds and storms, cloud formations, aerodynamics and the sound barrier and navigation, he draws on long experience in worldwide navigation.

Your Pilot's License, Joe Christy and Clay Johnson; Crown Publishers, 419 Fourth Ave., New York 16. A primer for fledgling aviators, this is a basic guide for light planes. Written in down-to-earth language and aimed at the Layman, it is divided into five sections covering the airplane, weather, navigation and radio licensing procedure and current models.

When & Where

SEPTEMBER

Sept. 5-11—SBAC, 1960 Farnborough flying display and exhibition, Farnborough, England.
Sept. 7-9—ATA, ground equipment subcommittee, Shoreham Hotel, Washington, D.C.
Sept. 8-9—Engine and Operations Symposium, Airwork Corp., Millville, N.J.
Sept. 12—IATA, 16th annual general meeting, Copenhagen, Denmark.
Sept. 12-16—International Council of the Aeronautical Sciences, 2nd congress, Zurich, Switzerland.
Sept. 12-16—ATA, agency committee meeting, ATA Conference Room, Washington, D.C.
Sept. 13-15—ALPA Air Safety Forum, Midway House, Chicago.
Sept. 14-16—National Assn. of State Aviation Officials, annual meeting, Wort Hotel, Jackson, Wyo.
Sept. 19-20—ATA, Traffic Conference I, Canada, France.
Sept. 20-22—National Business Aircraft Association, annual meeting, Ambassador Hotel, Los Angeles.
Sept. 20-22—ATA, production planning and control, subcommittee meeting, Hyatt House, Burlingame, Calif.
Sept. 25-27—International Northwest Aviation Council, 24th annual convention, Harrison Hot Springs, British Columbia.
Sept. 26-Oct. 7—International Labor Organization, civil aviation meeting, Geneva.
Sept. 27-29—ATA, altitude & static system maintenance, subcommittee meeting, Marriott Hotel, Washington, D.C.

OCTOBER

Oct. 3-5—Air Traffic Control Assn., 5th annual meeting, Sheraton-Palace Hotel, San Francisco.
Oct. 11-13—ATA, engineering & maintenance conference, Muehlebach Hotel, Kansas City, Mo.
Oct. 25-27—ATA, non-destructive testing subcommittee meeting, Marriott Hotel, Washington, D.C.
Oct. 4—New York State's 13th Annual Airport Development and Operations Conference, Hotel Onondaga, Syracuse, N.Y.
Oct. 6-9—National Pilots Assn., pilots' fly-in weekend, Western Hills Lodge, Wagoner, Okla.
Oct. 10-14—Society of Automotive Engineers, national aeronautics meeting, Ambassador Hotel.
Oct. 19-20-21—Southeastern Airport Managers Assn., Fair Horizons Motel, San Francisco.

NOVEMBER

Nov. 2-3-4—10th Aircraft Hydraulics Conference, Pick-Fort Shelby Hotel, Detroit, Mich.
Nov. 15-17—Aviation Distributors & Manufacturers Assn., 35th Meeting, Riviera Hotel, Palm Springs, Calif.

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BFG erosion shoes are supplied in one piece, contoured to fit the part. Thus installation is simple, requires no special tools. Valuable maintenance man-hours are saved.

The well dressed radome wears a shoe specially made for the job. For your requirements contact *B. F. Goodrich Aviation Products, a division of The B. F. Goodrich Company, Dept. AL-9, Akron, Ohio.*



EROSION SHOES ON BOEING 707 ANTENNA



UHF antenna



Fin probe antenna

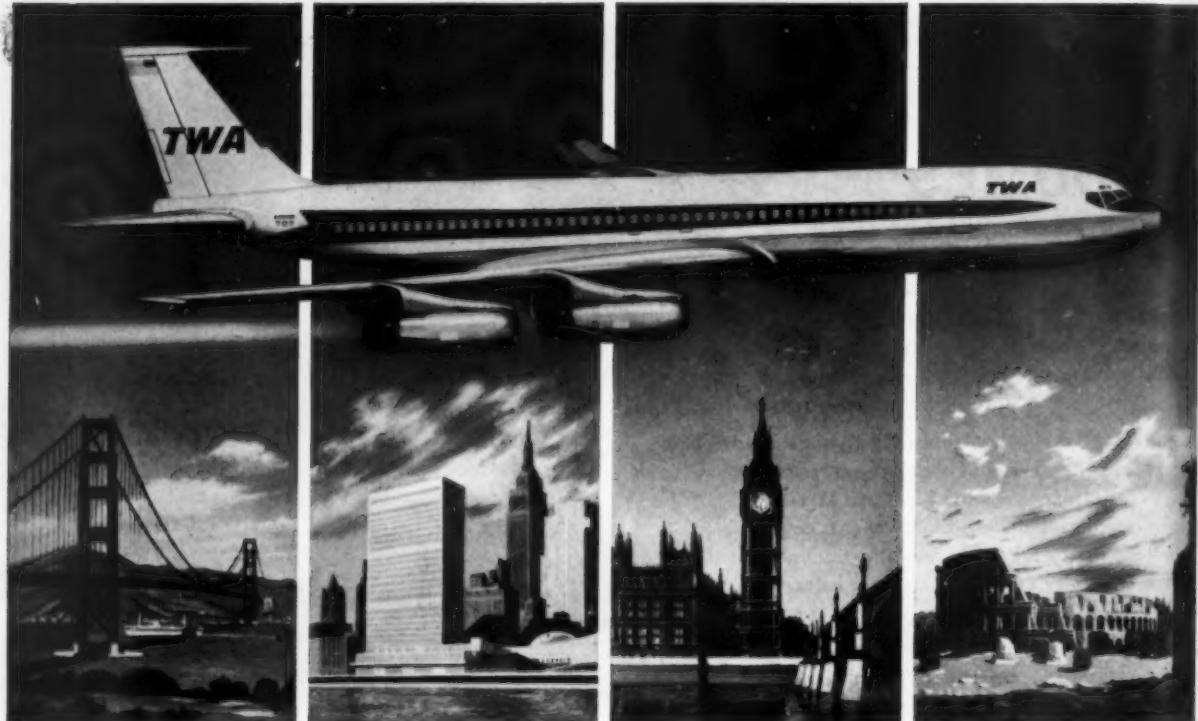


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SEPTEMBER, 1960

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MATS

Number to watch is 2.9¢. That's the innocent-looking per passenger-mile price floor set by CAB for airline carriage of MATS passengers. But it's become an explosive number. Battle lines are drawn. Smaller MATS contractors claim it's designed to make jets profitable, will drive everyone except big airlines out of business. They want about 2.1¢, say they can profit at this rate. MATS agrees, fought it up to the White House without success. Forecast: Congress will decide the issue, probably with a compromise figure.

Story of MATS' role in Congo airlift hasn't been told. It's one of unprecedented peacetime personnel performance. Pilots flying 160 hrs. a month, ground and flight crews constantly exposed to jungle atmosphere during layovers on 11,000-mile roundtrip from Chateauroux, France. A tremendous effort in every respect.

Labor

ALPA president Sayen may be in deep trouble. Pilot's union is suffering numerous reverses. Loss of face in age-60 and crew seat battles with FAA is feeding dormant dissension in ranks and staff. Southern Airways situation, split with stewardess union are making matters worse. One-time CAB chairman James M. Landis is rumored candidate for ALPA presidency or top executive post.

Airports

Big upheaval in trip insurance practices may be coming. For passengers, lower benefits and lower premiums. For airports, less revenue. FAA is leading the way at Washington National, hopes to influence other airports. Over-the-counter policy limit is cut from \$425,000 to \$165,000. Concessionaire will pay annual fee instead of percentage of gross, cutting cost in half (FAA was getting 60¢ of premium dollar). Policy limit may curb homicidal or suicidal impulses. Flat fee means contract winner must bid low on premium he will charge without downgrading coverage. FAA will also cut machine-dispensed policies.

Air Union

Air Union is going very badly. It won't start until next year at earliest, then not on full-scale basis. Government red tape is bogging down the Air France-Alitalia-Lufthansa-Sabena combine. Also, at least one member is thinking it might do better going it alone. At present, Sabena, hit hard by Congo crisis, is a liability rather than an asset to Air Union. KLM, which didn't join, may now go into SAS-Swissair partnership, but perhaps not as a full member.

FAA

New crew complement issue is stirring. FAA Administrator Quesada holds key to solution. Question: does British Armstrong-Whitworth Argosy freighter need a flight engineer? The Viscount, its passenger equivalent (four Dart engines), doesn't have one. But unlike Viscount, the Argosy, ordered by Riddle, exceeds arbitrary 80,000 lbs. limit set 12 years ago by CAB. British won't call for three-man crew, will probably ask FAA to follow suit. But first contact with FAA staff hints engineer might wind up in cockpit for want of FAA action, an omission that could damage Argosy's commercial future in U.S.

INDUSTRY AT A GLANCE



NEW EQUIPMENT

Speculation over the big orders to come continues to overshadow current new transport buying as orders in August began and ended with Eastern Air Lines' commitment for 10 Boeing 720s at \$44 million for 1961 delivery. A new twist in airline buying gives EAL the alternative of direct purchase or exclusive lease through a corporation to be set up to handle the deal.

But the big stakes due to flow into the short medium jet market remain in airline pockets. United's "several weeks away" decision on the Boeing 727 becomes more than a month old. A big team of Eastern engineers spends 10 days in Seattle, presumably on 727 briefing. Douglas borrows GE's Caravelle for a whirlwind tour of every major airline center in the U.S. in a convincing demonstration of its ability to operate on a tight schedule.

Unannounced is a single-plane Caravelle sale by Douglas, presumably to a corporation; another airline order for Eland Convairs; an option for three Canadair CL-44s by a U.S. carrier and the sale by Lockheed of five Electras originally destined for Capital.

On the resale scene, Riddle Airlines is about to buy anywhere from three to seven DC-7s from General Aircraft Leasing Corp. and will modify them for convertible passenger/cargo service. They will mark the first airline DC-7s to be resold. Aircraft are former SAS and Swissair models and are to be delivered by the year-end.

Southern Airways is negotiating with Eastern for five Martin 4-0-4s. Ariana Afghan Airlines receives a Development Loan Fund grant of \$700,000 to buy a DC-6C.

IATA POLITICS

With no warning whatsoever, IATA traffic director John Branner was fired after seven years in the job. In a surprise move, director general Sir William Hildred demanded okay from executive committee for the ousting, pressed the issue to the point where the group either had to recognize his authority or override it (see Personal View, p. 9). The committee went along reluctantly. No successor has been named. Look for more on "The Branner Affair" in October.

MANAGEMENT

TWA is without a chief executive for third time in five years following sudden and unexpected resignation of president Charles S. Thomas. Lack of authority from Howard Hughes is believed the chief reason.

Thomas reorganized TWA, showed major gains. Resignation is delaying financing plans, deliveries of Convair 880s, merger with Northeast. E. O. Cocke, senior v.p. and general manager, is operating the company until a new president is named, and a five-man executive committee is "available for policy decisions."

Disagreements over policy led to resignation of Gordon M. Bain as Northwest's v.p.-sales.

Reorganization and new financing plan are in the works at Seaboard & Western, which lost \$3.8 million last year and \$1.8 million in first four months of 1960. Named general manager and acting board chairman: Richard M. Jackson, until recently a Laurance Rockefeller aviation advisor, before that a longtime American Airlines operations staff official. Elected a director: Peter J. Aird, of Canadair, a major creditor of S&W. Ray Norden continues as president.

LABOR

Accomplishing what many said couldn't be done, Southern Airways is very much in business despite a three-month ALPA strike. Here's the picture: 115 non-union pilots hired, with 30 captains checked out and more qualifying. Of its original 60 flights, local line is operating 33. Flying hours are 10,500 daily, about 50% of total. There's at least one schedule a day to every point served.

Passengers in May, last full pre-strike month, totaled 31,000. June showed 7,300 and July 7,400, with 12,000-13,000 forecast for August. Full operation is expected by end of September. About 160 pilots are needed to meet schedules.

ALPA is being thwarted in efforts to control Air Line Stewards and Stewardesses Assn. Dissatisfied with affiliation, ALSSA wants its own AFL-CIO charter, says it's had only "loose working relationship" with ALPA for three years. ALPA president C. N. Sayen named new ALSSA officers, claimed union has no authority to disaffiliate. But ALSSA president Rowland Quinn moved union records out of ALPA offices overnight, plans to go it alone.



SPERRY IIS

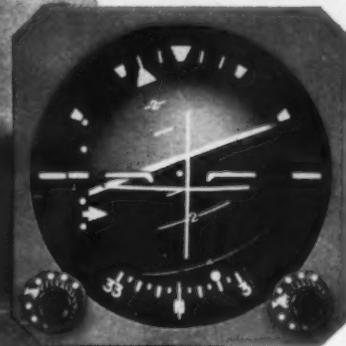
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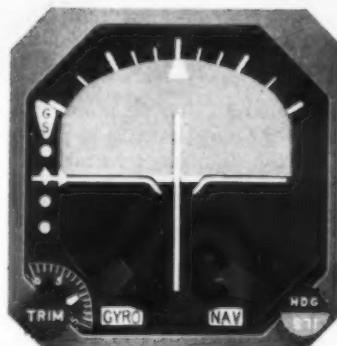
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TYPICAL MINIMUM SYSTEM



R-4
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Provides radio deviation, heading, power warning, to-from indication and glide slope.

INDUSTRY AT A GLANCE



ATC/COMM/NAVAIDS

Important FAA study soon to get underway at Chicago's O'Hare International Airport will determine minimum safe separation for parallel runways handling simultaneous landings under IFR conditions. Results of tests could materially increase airport capacity by virtually doubling present acceptance rates in bad weather operations. Cook Electric Co., Chicago, has been engaged to operate special ground equipment and record data at O'Hare. FAA hopes to have answers by January 1.

AIR CARGO

United Air Lines has progressed to the experimental stage with a "profit analyzer" to aid cargo sales. The result of three years of study, it is being used with a number of Chicago firms before release to cargo salesmen this fall. In first stage of its use, a "rule of thumb" formula indicates airfreight is profitable to a company if the added cost of air shipment is less than 9.5% of the cost value of the goods.

In its full-dress application, UAL would send cargo reps to a prospective shipper, analyze his distribution system, service his business and, in effect, become "account executives" instead of salesmen.

Air Transport Assn. committee has finalized its Air Cargo Terminal Planning Guide, expects to publish in booklet form shortly. Significant feature is design for future expansion in terminal layout (*Airlift*, Jan.).

AIRCRAFT SERVICES

Rolls-Royce Dart overhaul facility of Airwork Corp., Millville, N.J. is in operation with Eagle Airways (Bermuda) its first airline customer and Raytheon and U.S. Steel, in corporate field. Airwork and Atlantic Aviation (Wilmington) have teamed up on novel engine exchange offer for Gulfstream operators starting January 1, 1961.

Atlantic will reserve a built-up Dart for each five Gulfstream subscribers; removes and installs engines at no charge; rents engine on per operating hour basis while owner's is in overhaul; builds up and reinstalls owner's engine after overhaul (within 45 days).

Pacific Airmotive Corp., Engine Division, adds \$1.4 million in overhaul billings for next 12 months in five separate contracts with airlines. PAC will turn out seven P & W JT3 jets per month for Continental; five to six R2800s for World Airways; R2800s for Frontier Airlines' Convairs; three R2000s for Brasilia Export Corp., agent for Lansa;

and, two to three R2800s per month for Trans-continental S. A., Argentine airline.

NEW ROUTES

Big expansion of U.S. routes in Pacific is favored by CAB examiner William Madden. His recommendations in important transpacific case are far from final, must still get approval of CAB and meet test of new White House policy on international route competition, due Sept. 15. Here's what Madden favors:

Pan American to serve Hawaii and Orient from major eastern, midwestern and west coast cities, with south Pacific route extended from Australia to Djakarta; **Hawaiian Airlines** to serve U.S. west coast with restrictions; major expansion for **Flying Tigers** with five-year cargo and nonsubsidy mail rights from major U.S. cities to Philippines, Hong Kong, Japan; **South Pacific's** Hawaii-Tahiti route renewed for five years and extended to San Francisco/Los Angeles; **Northwest** from Seattle, Portland, Los Angeles and San Francisco to Tokyo, Manila and Hong Kong, plus operation from these four U.S. cities to the Far East via Honolulu; nonstop rights for **United** to Hawaii from mainland points; extension of **TWA** from Bangkok to Tokyo via Hong Kong.

AIRPORTS

Five parts of a new airport manual are off the press at International Civil Aviation Organization, covering such items as aircraft characteristics affecting airports (Part 3); pavement strengths (Part 4); obstruction surveys (Part 5); rescue and fire-fighting services (Part 7) and heliport design (Part 10). Order through ICAO regional offices or sales agencies referring to Document 7920-AN/865.

MISCELLANY

Vickers Vanguard introduction by British European Airways is being set back to next March 1 . . . France's entry as a DC-3 replacement, the 23-passenger **Max Holste Super Broussard**, enters the flight test stage. It first flew on July 29 at Rheims.

Allegheny Airlines plans to shift its maintenance base from Washington to Pittsburgh, is negotiating plan for a \$3.5 million facility . . . **Trident** is the new name picked by De Havilland for its DH-121 three-jet transport due to see service late in 1963.

SIDELINES

American Airlines copped the two top spots for transportation planning during the current political campaigns. Democrat Kennedy, whose family purchased a surplus AA Convair from Fred B. Ayer, picked Bill Hartigan of Boston for the job. Republican Nixon chose Don Campbell, but Nixon does his flying in a leased United Air Lines 340 . . . Least publicized pilot miscues in '59 were two FAA accidents, one in which pilot forgot to feather prop during a Convair 440 engine fire emergency and another, a "too low" DC-3 approach that landed short and bounced onto the runway.



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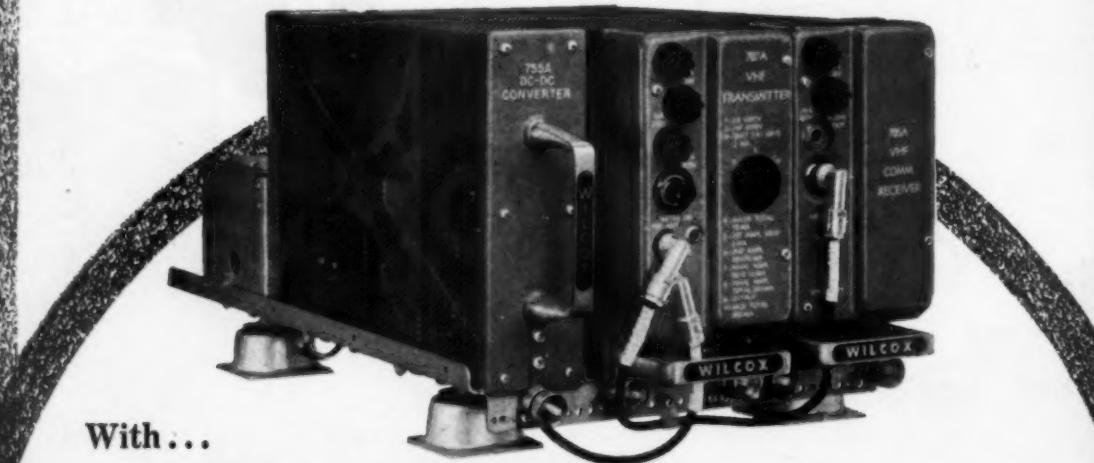
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- Completely transistorized power supply
- 560 crystal controlled receiving channels
- 360 crystal controlled transmitting channels
- Complete system weighing only 37.5 pounds

These, plus many additional features, make the Wilcox VHF Communications System the finest available.

This complete airborne installation consists of a Model 705, 560 channel receiver; a Model 707, 360 channel transmitter; a Model 755, transistorized power supply and combination shockmount.

The receiver provides 560 channels with 50 kc spacing from 108.00 through 135.95 mc; while the transmitter provides 360 channels with 50 kc spacing from 118.00 through 135.95 mc.

The Model 755 DC to DC Converter is transistorized, weighs only 8.75 pounds, and supplies both 250 and 500V DC at 250 and 320 milliamperes, respectively. A unique cast aluminum "heat sink" protects the transistors from excessive heat buildup.

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**MODEL 756
TRANSISTORIZED POWER SUPPLY**

Size: 10½" L x 4" W x 3" H

Weight: 4.75 lbs.

Power Output: 250 V DC @ 500 ma., cont. to 71° C

Power Requirements: 27.5 V DC @ 7 amps.

Transient Protection: "Spike Swallower" circuitry included

**MODEL 754
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Size: 2" W x 2" H x 5" L

Weight: 15 oz.

Power Output: 250 V DC @ 100 ma., cont. to 71° C

Power Requirements: 27.5 V DC @ 1.0 amp.

Transient Protection: "Spike Swallower" circuitry included



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N. E. Uzzell

UNBOLICITED IN-FLIGHT LETTER FROM MR. W. E. UZZELL, V. P. OF ROYAL CROWN COLA CO., COLUMBUS, GA.

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The Merger Pot Keeps Brewing

TWA-Northeast and United-Capital are only the beginning; No. 3 is in the works. Even locals may merge

IN LINE WITH earlier *AIRLIFT* forecasts, the airline merger situation is boiling.

Hard on the heels of the TWA-Northeast proposal, (which was to pass its last "preliminary" hurdle with the TWA board of directors on August 31), another merger bid reached the announcement stage.

United Air Lines has proposed to absorb Capital Airlines and the boards of directors of both companies didn't wait long to give their approval. CAB has set September 15 as the date for a prehearing conference in an effort to expedite matters.

United is No. 2

United is the second largest domestic trunkline. Last year, despite its relatively late entry in the jet competition, it flew 5.2 billion revenue passenger-miles for total operating revenues of \$314 million and a net income of \$12.8 million.

Capital is the fifth largest trunk. In 1959 it flew 1.6 billion revenue passenger-miles and took in operating revenues of \$108 million, but at a loss of \$1.7 million.

Combined, the carriers would comprise the largest single airline in the world. It would rank second to American only in freight ton-miles and total ton-miles, a position that UAL already holds in both categories without benefit of a union with Capital.

Capital-United Merger Terms

Stock—Capital stockholders would get one share of UAL common and five-year warrant to buy 1½ shares at \$40, for each seven shares held.

Bonds—Holders of Capital's subordinated debentures are offered 20 shares UAL common for each \$1,000 debenture held. At least 85% of the \$12 million in debentures must be exchanged.

Vickers—Creditor Vickers-Armstrongs Ltd. would get \$15.9 million in UAL preferred stock, 60,000 shares of common and warrants to buy 200,000 shares at \$45. Also takes back 15 Viscounts as surplus to the merged airline.

Status—Merger proposal approved by both boards of directors and Vickers pending ratification by stockholders of both airlines on October 4. Approval also subject to "some action" by CAB before February 1, 1961. Foreclosure by Vickers extended to October 16. CAB prehearing conference set for September 15.

Considering Capital's seriously ailing financial situation, the United proposal met with immediate favorable response in many quarters. W. A. Patterson, UAL president, told Capital employees that every effort would be made to retain all of them.

Although CAB approval of the proposal was taken for granted, there were later signs that the approval road may not be as smooth as first indicated.

There appeared even a strong possibility (or probability) that at least one other proposal for absorbing Capital might well be placed before both the Capital stockholders at their October 14 meeting, and before the CAB. Nobody was doing any talking, but the United proposal started some rapid scurrying in other places.

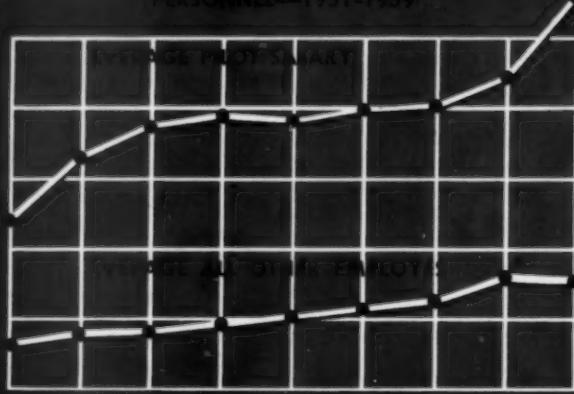
CAB has promised to expedite all merger proposals coming before it. But past experience has shown that despite every effort to rush proceedings, mergers are complicated matters and require considerable procedural time regardless.

Capital's bondholders, as well as some stockholders, were not very happy with United's offering. But in view of Capital's own precarious financial situation, they have had little choice but to accept it, unless a better one comes forth, as it well might.

The United-Capital merger proposal, however, was by no means the only activity in the industry. A third major proposal involving two other trunks is in the preliminary stages and that won't be the end, either. There is even merger talk within the local service industry, although insiders believe nothing will take shape in this area during 1960. ■

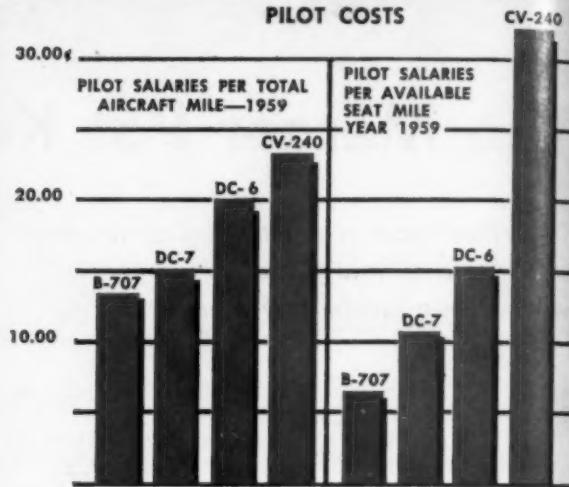


COMPARISON OF PILOT PAY WITH
AVERAGE SALARIES OF ALL OTHER
PERSONNEL—1951-1959

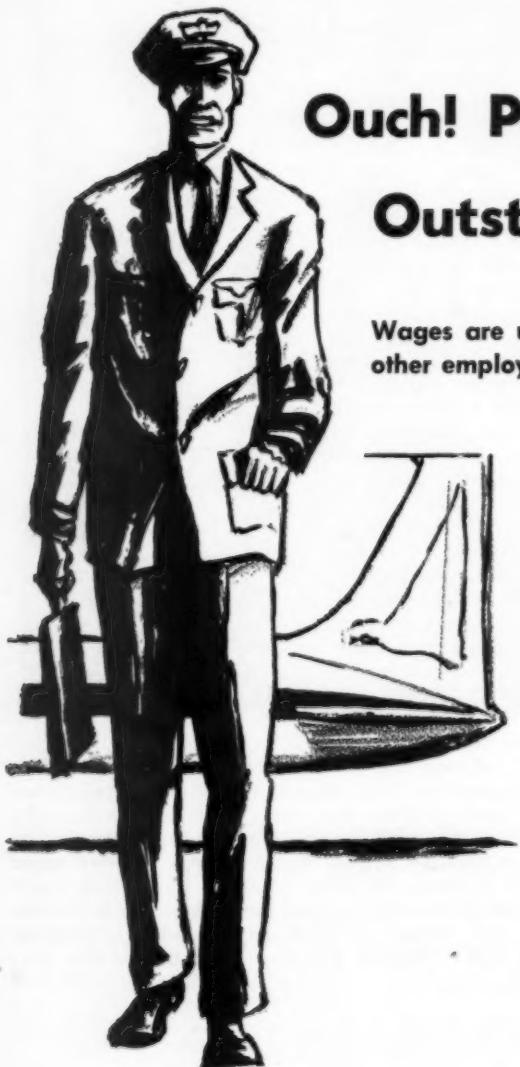


Pilot pay has climbed sharply beyond \$15,000 annual average compared to straight line trend for other airline employees.

PILOT COSTS



Higher pilot costs for small aircraft (240) points up plight of local airlines operating equipment in this class.



Ouch! Pilot Pay Gains Outstrip Everything

Wages are up 97% since '51,
other employees get 56% more

By J. S. Murphy

ARE THE AIRLINE PILOTS guilty of "featherbedding" in their working contracts with the carriers and what is it costing the industry today?

The constant drive of the powerful Air Line Pilots Assn. to improve pilot wages and working conditions has made it possible for a senior pilot to earn \$30,000 a year and work only 12 days a month doing it.

By means of the so-called "duty-rig" and the "one-for-four" guarantee by which every pilot is assured a minimum of one hour's pay for every four hours away from home, even the most junior pilot is assured of being away no more than 45% of the time, including overnight layovers.

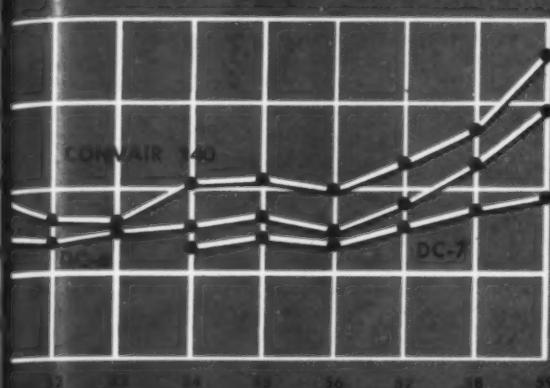
These are examples. To more thoroughly explore what has been happening to pilot pay, *AIRLIFT* selected and analyzed the pilot contracts and CAB cost reports of what it considers a good representative carrier (American Airlines) to present this exclusive report. Here are the results.

Pilot pay has risen far more sharply than that of other airline employees. The average pilot and copilot on AA earned \$8,332 in 1951, but by the end of 1959 was earning \$16,382—an increase of 97% or \$8,050 in eight years.

During this same period, salaries of all other AA personnel rose only \$2,258 or 56.5% from \$3,990 to \$6,248.

Despite the trend toward larger, faster aircraft, pilots

PILOT SALARIES PER TOTAL AIRCRAFT MILE
1951-1959 DATA FROM AIRLINE REPORTS TO CAB



The job's the same, but the pay scales change. Note climb in 240 and DC-6 pilot costs from 1956 to 1959.

comprise the same proportion of employees—7.7% in '51, 7.0% today. But under the impact of disproportionate wage increases, pilot pay has increased from 14.8% of company payroll in '51 to 16.5% in '59.

This has resulted in a dramatic increase in cockpit crew costs (pilot, copilot and engineer salaries and layover expense) from 0.482¢ per revenue passenger mile in 1951 to 0.586¢ in '59, a jump of 21.4%. The average seating in AA's aircraft increased from 45.7 to 64.9 in this period (up 42%), speed increased from 216 to 258 mph (up 19%), giving an increase in seat miles per hour flown of 70%.

Jet productivity lags behind

If crew costs had simply kept pace with added productivity of the aircraft, the bill for crew salaries and expenses would have been a whopping \$5,832,000 less than the \$32,856,000 paid.

To make matters worse, the steady shift from first-class to coach traffic has nullified the fare increases of the last eight years. In '51 America's average yield per revenue passenger mile was 5.58¢ and in 1959 it was 5.63¢. While crew costs per passenger mile have risen 21.4%, the company's rate of return is up less than 1%.

Closer analysis of pilot salaries on various aircraft shows a striking disparity in crew cost per plane and seat mile:

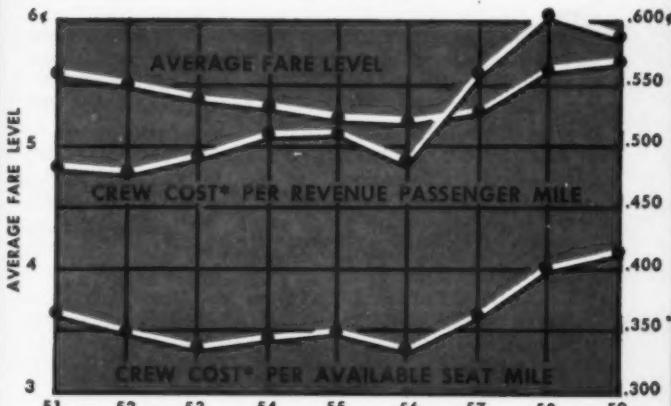
Aircraft	Cost/Plane-mile	Cost/Seat-mile
707	13.75¢	0.135¢
DC-7	14.90	0.221
DC-6	19.73	0.307
240	23.23	0.649

Not only are pilot costs on the 240 almost twice those of the 707 per aircraft mile, but they are almost five times as great per seat-mile. And the greatest impact of wage increases and costly work rules has fallen on the smaller equipment. In '52, AA paid its pilots 13.29¢ per mile to fly the 240. By 1959, wages had risen to 23.23¢, a jump of 75%.

In the same period, DC-6 pilot salaries increased from 11.8¢ to 19.73¢, a jump of 73%. Since their inauguration in '54, DC-7 costs rose from 11.51¢ per mile to 14.90¢ in '59, up only 29%.

The big reason for the heavy pay penalty levied against smaller, older aircraft is the "peg speed" pay formula.

CREW COST VS FARE LEVEL
1951-1959



*SALARIES OF PILOTS, CO-PILOTS, ENGINEERS PLUS LAYOVER EXPENSES

Year 1956 was turning point. With fares at low of 5.3¢ per passenger-mile, crew costs jumped from 0.48¢ to 0.58¢.

Source: American Airlines' CAB reports

While pilots flight pay starts when the aircraft begins to roll and includes both taxi and air time, the "peg speed" used for pay computation often represents the maximum cruise speed of the airplane.

A comparison of the block speeds actually logged by American Airlines and the pilot contract peg speed show how far out of line with reality the pay formula is and how costly it has become:

Aircraft	Block Speed	Peg Speed	Added Cost (Approx.)*
240	155.2 mph	240	\$523,000
DC-6	202.5	275	573,000
DC-7	265.8	330	422,000
707	429.8	450	53,000

* Year 1959

The average AA Convair pilot is paid for some 7,000 miles he doesn't fly while the jet pilot is paid for only 1,600. The formula has least effect on the big, fast jets in longhaul nonstop service. On shorthaul routes, the local airlines must spend more per aircraft pilot mile to fly DC-3s and F-27s than the trunks do the jets.

What are the working rules which airline managements complain of so bitterly as "featherbedding," or more recently "featherbirding."

The most obvious is the third pilot in jets. Whatever the merits from the safety viewpoint, the 3rd pilot is adding more than \$5 million to the carriers' wage bill this year. As an example, American's jet crew cost with a 3rd pilot was \$121.50 per hour in the first quarter of 1960 compared to only \$93.50 per hour for Continental with only two pilots.

More pay, less work

Other, more subtle contractual provisions are the "duty rigs," which provide, in the case of American, that a pilot "on duty" on turbines for four hours or less shall be paid a minimum of three hours flight pay, irrespective of actual flying done. For 4 to 10 hours on duty he receives a minimum of 4 hours flight pay and so on up.

Reminiscent of "portal-to-portal pay," duty time is defined as beginning "one hour prior to the scheduled departure time . . . and shall continue until 15 minutes after the scheduled arrival time at the conclusion of the day's

flying assignment." Further, the pilot is guaranteed a minimum of one hour's pay and flight time credit for every four hours away from home, again irrespective of flying done.

Due to weather and other conditions, it is often necessary to deadhead pilots to pick up flights. The pilot is paid and credited half-time for all hours spent deadheading. In many contracts, the pilot is entitled to deadhead voluntarily between bases to pick up segments of his bid trip, and to be paid for such deadheading. It is not uncommon for two pilots to "double deadhead" to pick up pieces of flights which could have flown by one without any deadheading.

Other contractual provisions which, in the eyes of management, are costly and lead to excess personnel are those which:

- Specify a minimum ratio of "reserve" pilots above those required to cover the schedule—it varies from one reserve pilot for every 11 line pilots down to one for six.
- Provide that line pilots will be paid and given time off when a supervisory pilot flies a trip.
- Prevent utilizing pilots' days off for training, even though the pilot is flying only 10 or 12 days a month. In many cases, pilots receive flight pay for using the simulator—a vital aid in maintaining pilot competence.
- Require that the pilot be paid scheduled or actual flight time, whichever is greater.

The complexity of pay formulas and the lack of precise

airline records makes it virtually impossible to price out exactly what the provisions of the various pilot contracts cost the airlines. However, the evidence is strong that pilot utilization is declining while pay increases. The following is American's reported experience:

Year	Pilots on Payroll at Year's End	Total Hours Flown	Annual Aircraft Hrs. Per Pilot	Avg. Pilot Salary
1956	1,539	563,569	366	\$12,414
1957	1,602	585,335	365	12,505
1958	1,490	539,046	360	13,474
1959	1,650	499,930	303	16,382

There are indications that management resistance to further pilot demands is rising, and that public sympathy for ALPA's cause is waning: Southern Airways is striving to rebuild its services using non-union pilots and shows no inclination to back down. The Courts have intervened in the ALPA "sickness strike" and enjoined the pilots to honor their contracts. The press has virtually unanimously upheld the FAA in its controversy with ALPA over the 3rd pilot seat. The Mutual Aid Pact between the airlines is being strengthened.

Time alone can tell the outcome as the airlines gird for another round of pilot contract negotiations. Pressures on both sides are high—as the airlines are faced with mounting costs and slipping load factors while the pilots apprehensively consider the spectre of technological unemployment.



Gigantic in all dimensions, the Dulles lounge dwarfs a Greyhound Scenicruiser.

FAA Nails Down Mobile Lounge Spec

THE MOST REVOLUTIONARY VEHICLE ever to invade an airport domain and one which might very well shape the design of future air terminals is making its way from speculation to specifications.

After exploring some 100 different proposals, FAA Administrator Quesada (see cover) has settled on the design of a mobile lounge for Dulles International Airport that will bring the far-flung loading gates and aircraft ramps right up to the wall of the airport terminal.

Under a \$750,000 contract to Chrysler Corp. of Centerline, Mich. (aided in body design by the Budd Co., Philadelphia) FAA hopes to have a prototype on hand next spring. After a series of shakedown tests, the "biggest passenger vehicle ever mounted on rubber tires" will greet first customers when Dulles opens next summer.

Big is an understatement

Everything about the "Quesadabus" is stupendous. Weight: 39 tons. Capacity: 90 passengers. It will measure 54 ft. long, 15 ft. wide and 17.5 ft. high, virtually dwarfing the 40 by 8 by 10 ft. outlines of a Greyhound Scenic Cruiser (the biggest thing on wheels on the highway today).

Powered by two 190-hp engines and steerable from

either end, the mobile lounge will be fully airconditioned and heated. When parked against the second floor of the terminal, music will be piped in. There will be no lavatory or drinking water provisions, but smoking (cigarettes only, we presume) will be permitted.

Once the lounge leaves the terminal to "mate" at its other end with the aircraft, it will be under two-way radio control. The folding ramp by which passengers board it becomes a door en route.

With a vivid imagination as to what damage a 78,000 lb. bus might inflict when barging into the side of a \$5 million jet even at low speeds, FAA engineers are calling for elaborate safety gear. A feeler rod extending forward from the bus will contact the aircraft first and alert the driver by buzzer. If the approach is unsafe, it automatically will apply the brakes.

But the most important safety features, says pioneer Quesada, are the three sets of stairs that let the people out if all the automatic doors and ramps don't work.

There's no word yet on cost, but it's a good guess the "Quesadabus" will run upwards of \$100,000 a copy. When Dulles International Airport opens in July 1961 (hopefully), FAA plans to have 20 lounges on hand, enough for the first full year of operation.

LESS THAN SIXTY DAYS the distinction of building the first turboprop cargo transport to be operated by a U.S. airline will fall to Britain's Armstrong Whitworth Aircraft as Riddle Airlines presses its schedule to get the AW-650 Argosy into service.

Sporting a new high in gross weight at 88,000 lbs. (it was 82,000), the Argosy will enter operation in an atmosphere paralleled by few, if any, aircraft in the past. From the day it starts flying outsized military cargo under Riddle's \$20-million Logair contract, the Argosy becomes a vital punch in the carrier's comeback fight for financial health under new president R. M. "Bob" Hewitt (See page 37).

All odds favor success and with it the prospect of a follow-on order from Riddle reportedly matching its original purchase of five aircraft. Coupled with the recent British government order for 40 aircraft, the twin-tailed freighter-coach looks more and more like a winner for Armstrong Whitworth Aircraft.

The most interesting facet of the Argosy that strikes us is the generous ratio of its payload to total gross weight. At 88,000 lbs. gross, it hauls a maximum payload of 28,000 lbs. or very close to 32% of its total weight. In Riddle's present operation, the C-46 at 12-14,000 lbs. payload represents at best 28% in payload and the 73,000 lb. DC-4 carrying 20,000 lbs. works out to about 27.5% in payload.

Performance is up

Before the gross weight increase, Argosy payload stood at 27,000 lbs. and its most economic range rested in the 350-600 mile area. The new weights, permitting it to haul about 27,000 lbs. for 600 miles and 24,400 for 750 miles, raise the best economy performance to 600-750 miles.

Much like the Vickers Viscount which blazed the turboprop passenger transport trail in U.S. airline operations, the Argosy is powered by four Rolls-Royce Darts. The only difference is the model number, the RDa 7/2 rated at 2,100 total equivalent horsepower for takeoff. Early Viscounts used the RDa 6 but the 800 series uses the RDa 7.

Here's how the British freightercoach shapes up in other areas:

Speed: Average cruise is 280 mph, approach is 125 mph.

Range: 1,700 statute miles with 20,000 lb. payload and no reserves, 2,500 miles still air range.

Field lengths: Takeoff at max. gross, sea level ICAO standard day, 4,650 ft.; landing 3,500 ft.

Dimensions: Overall length—86 ft. 9 in.; height—27 ft.; fuselage length—60 ft.; 7 in.; wingspan—115 ft.; wing area 1,458 sq. ft.

Cargo dimensions: Freight floor length—46 ft. 8 in.; width—10 ft.; sill height—4 ft.; minimum cabin height—6 ft. 8 in.

Door dimensions: Front—8 ft. 4 in. wide by 6 ft. 8 in. high; rear—8 ft. 8 in. high by 6 ft. 8 in. wide.

Fuel capacity: 3,960 U.S. gals.; water methanol—165 U.S. gals.

Cargo volume: 3,680 cu. ft.; cargo floor area—426 sq. ft.

Beyond the AW-650 freightercoach, which can be arranged to seat 77-89 tourist passengers, Armstrong Whitworth has a variety of proposals for the Argosy.

The AW-660 military freighter, being built for the RAF, is also proposed with two Rolls-Royce Tyne 1s rated at 4,600 tshp for those favoring a twin engine version.

The AW-670 or air ferry version would transport six cars and 30 passengers by using an optional unpressurized fuselage having a 14 ft. 6 in. width. The passengers would be carried on a second (upper) deck.

The company also proposes to carry this model one step further in the AW-671 Airbus which is arranged to handle up to 126 tourist passengers for short-stage transport over ranges in the order of 200 to 300 miles. ■

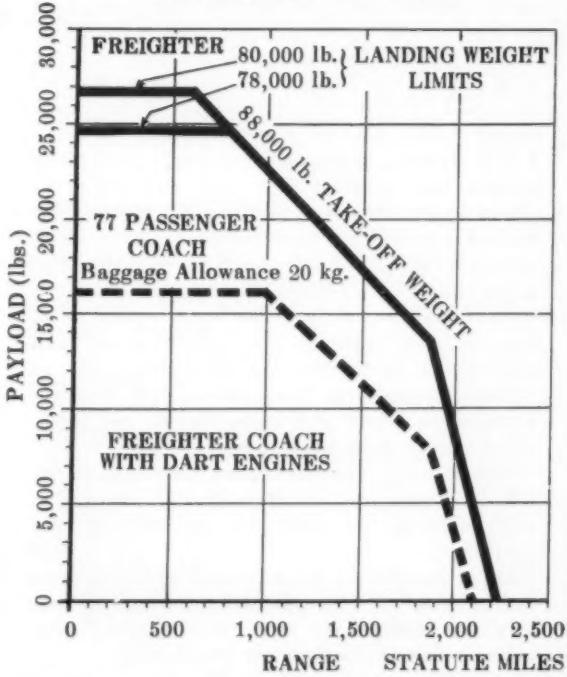
Argosy Freighter Set for Debut

**British-built freighter nears service
as Riddle Logair operation approaches**



Now nearing British and FAA approval, here's how the Argosy looks in Riddle markings.

Argosy Payload Vs. Range



Is Local Subsidy Here to Stay?

The answer is a qualified YES, but
drastic CAB action could make it NO

SUBSIDY is a nasty word. It is a term that demands qualification but often emerges naked and alone, either in the shortsightedness of those who fostered it (Congress) or the abuse of lobbyists who oppose it.

The trunk airlines, now free of its stigma, know its pitfalls only too well. The locals are deep in its clutches.

Local subsidy is on the climb. Congress, the greatest

10 Ways to End Subsidy

- Remove all local service operating restrictions. Allow locals to compete in dense, shorthaul non-stop markets on a non-subsidy basis. The trunks no longer need "protection" from the locals.
- Apply the "Use it or lose it" policy. Get Congress to endorse it, then enforce it. Its present administration is meaningless, sometimes harmful.
- Settle the local mail rate policy once and for all. Uncertainty and delay are serious handicaps to local airline financing.
- Eliminate excessive trunk competition with locals. Suspend all dormant, unused trunk airline certificates, allowing locals to develop these neglected services without threat of future invasion by trunks.
- Lift the \$5 million ceiling on guaranteed loans. New aircraft are highlighting the obsolescence of the DC-3, but \$5 million is too little to permit much-needed, full-fleet modernization.
- Stop inflicting costly civil air regulations on locals without first weighing their real contribution to safety against their high cost in additional subsidy.
- Don't repeal the transportation tax. The locals are collecting anywhere from \$10- to \$15-million a year and this is an indirect return on subsidy.
- Do something to improve local airline ATC facilities. Their lack can skyrocket breakeven load factors from 46 to 70% and often does.
- Encourage, perhaps force, area airport development as the means of bringing better, less costly, air service to more small communities.
- Ease up on burdensome reports. One local spends \$200 a month on "Use it or lose it" reports to CAB although its route has no cities in this category!

(Each of the above is recommended by one or more airline heads as a means toward the end of subsidy. For elaboration, read their detailed comments in this and subsequent installments.)

champion of its need, is surprisingly alarmed. An almost new CAB, the most effective weapon toward its elimination, plods uncertainly on the fringes of action that could turn the tide.

Are the locals destined for permanent subsidy? What would it take to rid these carriers of subsidy once and for all? No one should know these answers better than the executives who run these airlines today.

As a service to the future of local air transportation and hence, all air transportation, *AIRLIFT* presents this exclusive report on how the best brains in the industry think the subsidy problem should be tackled.

Because of the overwhelmingly gratifying response received from these officials and the far-reaching significance of what they have to say, this feature will be extended into the next several issues. Read here the first installment.

L. B. Maytag, Pres.
Frontier Airlines

UNLESS DRASTIC STEPS ARE TAKEN by CAB, it is quite possible that the local carriers can expect to remain forever subsidized. It appears that some in the industry and the regulatory agency even favor permanent subsidization of local service airlines.

It is clear that the first step toward economic progress is a return to basic free enterprise. The Congressional Committee on Appropriations in its report on the Independent Offices Appropriations Bill urged the Board to suspend trunkline carriers in local service markets, keep to a minimum those local service routes that cannot possibly be made to pay and permit local service carriers greater flexibility within their assigned markets.

These steps have long been advocated by local service management and we have all heard it so much that it has become trite, yet it is nevertheless true that these moves would do much to strengthen our position. In our own case, we have several profitable non-stop routes within our system which are not being operated by any carrier presently.

At the same time we are overflowed by trunks on our two strongest routes. Western Airlines parallels us to Billings, Montana with three intermediate stops using DC-6 equipment. This is definitely a local service type route. Western goes non-stop Denver to Phoenix while we must make a minimum of two stops. United and Frontier both fly non-stop between Grand Junction and Denver, Frontier using a Convair and United a DC-6B.

In the Seven States Area Case the Board announced its "use it or lose it" policy. The avowed purpose of this program was to insure a carrier with at least five passengers a day from each town. But as with past policies, the Board

"For want of drastic CAB action, subsidy could remain forever."



Maytag

has not acted as rapidly as it should. Frontier has attempted to follow the CAB directives as set forth in the "use it or lose it" policy.

In Nebraska we have asked to suspend a segment and cities which are far below the five per day standard. After some delay, CAB has given its blessing, but not before the situation aroused Nebraska politicians who are claiming that Frontier's service has been inadequate and have even filed a pleading to that effect.

This political harassment designed to discredit Frontier has, in reality, only served to further discourage traffic. A look at the facts shows that Frontier's service in Nebraska has not only been adequate but excessive.

These are the Congressmen who say out of one side of their mouth that airline subsidies must be reduced while they vigorously support route proposals which have increased subsidies tremendously. Somehow the CAB must be made immune to pressure politics and cases must be decided on facts.

In analyzing the routes given Frontier in the Montana and Seven States cases, using May, 1960 as representative, 22 stations on these routes enplaned 1,730 passengers and deplaned 1,620 for a total of 3,350.

These 22 stations represent 33% of Frontier's total and the mileage amounts to 40% of Frontier's total route miles, yet they produce only 12% of our total passengers.

This is the kind of unrealistic operation in which we are involved in Montana, the Dakotas, and Nebraska. While I have not costed out the expenses precisely, my best estimate would be that it costs Frontier in excess of \$365,000 a month to operate these routes which produce revenues in total of approximately \$57,000. It appears to me the 22 points in question cost the government in excess of \$3.6 million in subsidy annually.

Avoiding the issues

Everyone knows the DC-3 is not an economical airplane. It should be obvious that air transportation today is only profitable when it involves long haul traffic. The Board and the local carriers themselves have avoided taking a forthright view of this fact. No local dares admit that he wants to be a regional carrier yet he knows that is his only hope for independence.

The locals must be allowed to compete freely with trunks within their own markets. The advent of the jet airplane opens a new market to locals. Some of the medium haul markets previously served by trunks will no longer be profitable to them with their large airplanes.

The local service carriers can make these routes operate at a profit very nicely with their new equipment. I'm not suggesting that local service should be abandoned, but rather that it should be subsidized by the carrier itself with long haul route authority. At the same time, carriers must be allowed to drop cities which show such little need for service that they require increasing amounts of subsidy.

There is not a local service carrier who, today, enjoys a healthy financial condition. They are all teetering on the plank of federal subsidy and in some cases a small delay in receipt of a subsidy check can put the company perilously close to bankruptcy.

When I assumed management of Frontier I promised stockholders a cleaned up operation and an improved economic condition that would permit dividends. While we have been successful in cleaning up the operations and reducing costs, we have not improved the financial condition to any great extent.

The complaints from stockholders have been numerous, most of them having had their money in Frontier for 13 years with no return whatsoever. A recently announced 12.75% return on investment will be a help, but it is certainly not a permanent forward step in reducing subsidy or solving our economic problems.

I must repeat that these problems can only be solved by allowing us to operate in our markets on a competitive basis and by giving us authority to utilize our modern equipment in extended non-stop flights.

**R. E. "Earl" McKaughan, Pres.
Trans-Texas Airways**

WE CAN ONLY SPEAK FOR OURSELVES but in answer to the precise question "Do you foresee subsidy as a permanent fixture for local service carriers on *existing route structures*?"—our answer can be yes. Of course, this means simply that existing route structures need modification.

The CAB can do several things which will in combination remove the need for the subsidy "crutch" as it is often mislabeled. The following is the action on the part of CAB which we feel would free local service industry of the subsidy "restriction." No attempt has been made to rank these programs or policies in order of importance. They are all important! Each can take the industry part way, but only the total can keep the progress towards self-sufficiency moving at a regular and predictable pace:

1. Prompt and vigorous application of CAB's "use it or lose it" policy. Trans-Texas, for example, now serves seven intermediate points which do not measure up to the minimum required by the "use it or lose it" policy. These seven stations represent 18% of the total now being served by Trans-Texas. Certainly then this is an area which can represent a major saving of subsidy dollars!

2. Reevaluation and lifting of unnecessary local service operating restrictions. Most of the restrictions in local service certificates were placed there for the purpose of protecting trunk carriers. This may have been desirable at the outset, however, it seems that the Board may have lost sight of their devastating effect.



*"Subsidy is a restriction
... not a crutch . . ."*

McKaughan

Certainly, at this late date, with the new types of equipment available to the trunks, the need for these protective restrictions has passed and a reevaluation is long overdue. While the trunks no longer need protection, the locals desperately need operating flexibility!

Stated differently—it is a strange paradox indeed that protects the big brother, the father or even the grandfather from the infant. Yet, somehow, this is exactly what has happened in the relationship between the trunk lines and local carriers at the Board. Locals are kept out of trunk route cases, yet trunks are permitted in local service cases. Locals are restricted! I know of no trunk being restricted to protect a local carrier and its subsidy requirement.

For example, Trans-Texas is certificated to serve Houston-Beaumont-Port Arthur-Lake Charles-Lafayette and New Orleans, yet we are restricted from serving Houston and Beaumont-Port Arthur on the one hand and Lafayette and New Orleans on the other. Yet, in the recent Southern Transcontinental Case, the Examiner recommended two additional trunks between Houston and New Orleans!

No real nourishing solids have been provided the locals—only new and difficult experiments, mostly thin soup routes and the occasional “toss of a bone” of an intermediate size trunk line marginal point. If the locals are to survive and be healthy, they must be freed from shackling restrictions to tap the really shorthaul markets of some substance!

3. Realignment and streamlining of local service systems. The route structure of the local service carriers must be streamlined so as to tie the segments into the major traffic generating centers. Terminal points on local service systems have been established as a matter of Board convenience, inasmuch as the routes have been awarded piecemeal.

The establishment of terminal points which have no relation to traffic flows has created built-in restrictions which prohibit the operation of expedited service for the major traffic flows within the area served by the local carrier. For example, 15 or 38% of the stations served by Trans-Texas are designed as terminal points on one or more routes.

4. Suspension of trunks in markets which are primarily local in character. Technological advances in aviation as represented by the new turbine powered aircraft used by the trunk carriers have made it imperative that the trunks be removed from the shorthaul local service market.

The ability of the trunks to render frequent and well-timed service to smaller cities has been sharply dissipated by the advent of pure jet aircraft and the necessity for them to compete with each other in the longhaul markets. It is only logical that the trunks should be replaced by local service carriers on routes which are not adaptable to their new fleets of aircraft. Not only will this eliminate a financial drain on the trunks, but it will make available to the locals some established markets they are better able to serve!

5. Adoption of mail rate policies which would permit and encourage experimentation and route development. The class mail rate recently announced by one of the Board members is a step in the right direction for the locals.

The adoption of an appropriate class rate should make possible the evaluation by the Board of the efficiency of carriers while encouraging efficiency through profit. Thus, the locals would be in a position to experiment, operate, and to plan on sound business and financial bases.

Certainly, these suggestions are not new but we have seen the industry grow from infancy! We have seen the problems grow with the industry. Think, for a moment, how these suggestions must look to a new board member who has no source of advice as to the urgency of local service problems or the merit of their proposed solutions.

This is the real problem: How can we tell our story?

“There's too much trunk competition in local service markets.”



Mitchell

T. R. Mitchell, Exec. V.P.
Pacific Air Lines

RELATIVELY MINOR CHANGES in the existing structure of Pacific's route, the discontinuance of trunk competition in local service markets, the re-adjustment of operating restrictions and a more realistic ceiling on government guaranteed equipment loans, would diminish Pacific's subsidy requirements now and pave the way for complete elimination of government assistance.

In terms of route miles, Pacific is the smallest of the 13 local carriers. To gain self-sufficiency, its route pattern must be expanded to embrace the major and minor trade centers and traffic hubs in its service area. This only involves the addition of a minimum of eight cities and route extension distances ranging from zero miles to serve Fresno to 425 miles for the inclusion of Phoenix and Tucson.

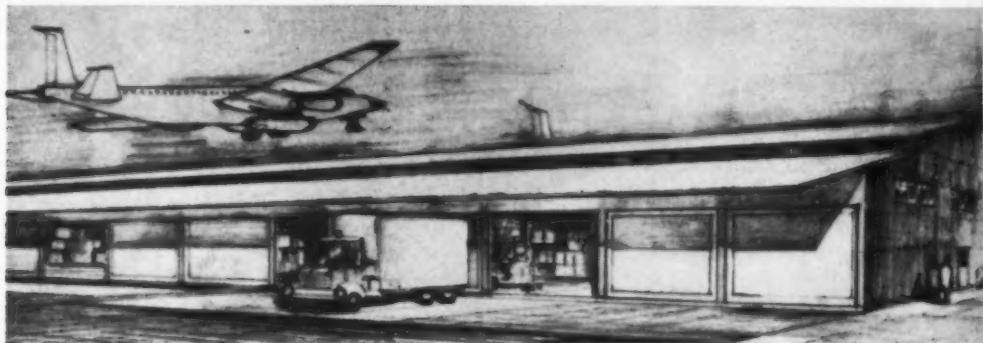
Pacific is burdened with too much competition in local service markets over its small 25-city system. It competes with one or more trunks for local traffic at 13 of its major traffic-producing cities and with other local service carriers in four principal markets. Only three of the 12 cities Pacific serves exclusively generate more than 500 passengers per month. Therefore, Pacific's progress toward self-sufficiency would be materially accelerated by the discontinuance of trunk competition in these local markets.

The operating restrictions in Pacific's certificate are outmoded and should be lifted except as required to assure adequate local service to all cities on its system and to prevent overflying segment terminals. Under the limitations of its present certificate, it is unable to compete effectively with unrestricted local service by trunk carriers in intermediate local service markets. Furthermore, these restrictions serve almost as effectively as a “closed door” restriction on Pacific in high density, shorthaul, terminal-to-terminal markets.

These markets are served as a by-product in trunk service without benefit of aggressive promotion or competitive scheduling. As a result of this condition, approximately 25% of the Los Angeles-San Francisco traffic is carried by a noncertified intrastate carrier which has progressed from a DC-3 operation six years ago to an almost hourly Electra service pattern today. Other so-called intrastate carriers and “fly free” operators are flourishing on traffic in these lush markets which could be profitably carried by Pacific to help pay for the sparse traffic generated at its smaller cities.

In today's aircraft market the \$5-million ceiling on government guaranteed loans limits the purchase of new, modern turboprop aircraft to a number well below the requirements of the average local carriers. While the upgrading of service by the introduction of modern aircraft has materially stimulated traffic and produced many benefits for the public and the carriers, it has also served to emphasize the obsolescence of the DC-3 and shortened its already overdue withdrawal from service. The guaranteed loan limit should be increased to permit modernization of local carriers aircraft fleets.

Projected plan for Los Angeles International Airport features heavy emphasis on cargo loading facilities.



Separate Airports For Cargo????

Mounting demands for cargo by air plus a growing fleet of converted piston transports force speculation on the capacity of present facilities to handle the expected boom in air cargo. To help clarify thinking on the part of industry leaders, AIRLIFT asked the question, "Do you think separate airports for cargo will become necessary?"

E. R. Quesada, Administrator, Federal Aviation Agency:
Our review of this subject indicates there is no single yardstick, such as the volume of cargo traffic handled, by which the need for separate cargo airports can be measured. Although the time may arrive when separate airports are needed for cargo operations, we do not envision them prior to 1968-70.

To put this matter into proper perspective, it should be noted that cargo operations are a relatively minor effort at our airports. Tons of cargo in 1959 were: Midway Airport (Chicago) 65,124; Idlewild (New York) 41,752; Los Angeles Airport 32,981; San Francisco Airport 31,659.

Translated into average daily aircraft activity of all-cargo aircraft, this would mean less than one departure per hour at Midway, which has the most tonnage.

Concerning the extent to which cargo will be carried on combination (passenger) aircraft in the future, it is believed the percentage of total volume so moved will become less and less. The primary factor underlying this belief is the introduction of efficient, uncompromised, turbine-powered cargo aircraft which will mark the beginning of a period of accelerated growth. As all cargo operations expand, passenger aircraft will play a diminishing role in large-volume, routine cargo movement. Combination aircraft will continue to handle certain types of

premium traffic such as mail and express.

We are convinced that air cargo has a great potential for growth. The need for separate cargo airports will be a matter of constant review and evaluation of both passenger and cargo operations and the characteristics of each individual airport to accommodate the growth in traffic.

E. E. Skinner, Manager, Cargo Sales, Eastern Air Lines:

No, certainly not for many long years. Cities are expanding their airport facilities and, at the same time, making provision for expanded cargo handling facilities—Idlewild, Chicago, Los Angeles, for example. This helps spread cargo costs per ton mile on a more economical basis. Separate cargo airports would involve heavy realty investment and operational costs which the airlines ultimately pay and would not be in the interest of lower per-ton-mile costs.

We are not aware of any special volume that might make separate cargo airports necessary or any city approaching such overall volume. Cargo will continue to move late so as to arrive early, and these are not the hours during which the heavy passenger movement occurs.

With far more cubic foot capacity and lift being built into new jet equipment than is needed for passenger baggage, we believe the excess space will be used for cargo to a greater extent than ever.

John C. Emery, President, Emery Air Freight Corp.:

Combination passenger-cargo aircraft will continue indefinitely to carry a substantial portion of domestic and international air freight, and there will be a continuing need for interchange between all-cargo and passenger-cargo aircraft. I am inclined to believe that any benefit which might be derived from a cargo-only airport would be outweighed by disadvantage.

To develop air freight volume . . . the most important factor is maximum capacity on frequent schedules in all directions. This will be provided by combining the cargo capacity of all aircraft. For maximum flexibility they should operate into and out of the same airports.

Robert W. Prescott, President, The Flying Tiger Line, Inc.:

I do not at this time see any need for separate airports for cargo operations. Certainly, specialized terminal facilities are needed and this need will continue to expand. But . . . there is no reason to separate the two operations by airports.

As to the extent of the amount of cargo that will be carried on the combination planes, I cannot be specific. I have long considered it uneconomical for passenger



QUESADA



EMERY



PREScott

Quesada: "no yardstick"

Emery: "benefit outweighed by disadvantage"

Prescott: "no reason to separate by airports"

operators to use space that could be occupied by 50¢ per-ton-mile passengers to make way for 20¢ per-ton-mile freight. Whether passenger operators will continue what I regard as a foolish policy when the freight tariffs approach the 10¢ level, I cannot predict.

John R. Wiley, Director-Aviation, Port of New York Authority:

Continuing studies of air cargo do not indicate that all-cargo aircraft operations will reach a level at which they will require a separate airport or at which they could economically support a separate airport. During 1959, for example, of the 831,800 aircraft movements at the four airports operated by the Port Authority, only 15,271 were all-cargo aircraft movements.

Charles L. Hood, Vice President, Riddle Airlines:

Frankly, I do not think, in the near future there will be a need for separate cargo airports.

Due to the high cost of airport construction and the fact that for many years to come small package freight and freight destined for smaller cities will continue to be moved on combination equipment, separate airports for passengers and cargo will not be feasible.

Ralph R. Theile, Director of Sales, Air Cargo Magazine:

Eventually I foresee that separate airports for cargo will be practical and economic necessities at "major hubs" such as New York, Boston, Chicago, Los Angeles, San Francisco, New Orleans and Miami. Dual purpose facilities, providing one landing and take off area but utilizing separate passenger and cargo complexes, must be visualized for Atlanta, St. Louis, Kansas City, Dallas, Seattle, Houston and possibly some other of the major air hubs. It is my belief that movement of things by air will be primarily on a "spoke and hub" concept. The environment of a major hub may extend anywhere from 100 to 500 miles. Traffic will funnel through these hubs for transport to another such hub and then be distributed through there to its contiguous environs.

One set of runways and navigational aids may actually serve two completely separate and distinct facilities at an airport site.

With the advent of faster, larger aircraft . . . increase in volume will necessitate terminal facilities beyond those in existence today or contemplated for the immediate

Wiley: "studies . . . do not indicate . . . separate airports"

Theile: "practical and economic necessities"

Dunlap: "may come about sooner than 1964-65"

future. At today's airports there just isn't enough land for the expansion I am convinced will become necessary.

S. C. Dunlap, Vice President-Cargo Sales and Market Development, Trans World Airlines:

The principal factors that will make such airports necessary are basically the airspace and air traffic control problem. The cities where this will become necessary somewhere in or about 1964-65, will be New York, Chicago, Detroit, San Francisco and Los Angeles definitely, and possibly Boston, Cleveland, and St. Louis.

When the air freighter trips per day reach a point where they are approaching 100 at airports like Idlewild, Los Angeles and San Francisco the air freight operation will have to move. This may come about sooner than 1964-65 . . . We have practically reached the saturation point with the number of schedules in the major cities already and when we start to add 100 or more freight trips it becomes a problem of which will get priority.

Cargo will continue to be carried on combination airplanes . . . and will move through combination airports while the freighter operation will be at a separate airport. In the last couple of years some airlines have had a so-so split . . . In 1960/61 it is conceivable that this ratio may change slightly for some carriers where maybe 60% is carried on combination jets, but by 1963 the trend is going to be in the opposite direction.

It appears that by the latter part of 1962 or early 1963 the all-cargo lift will far exceed the cargo lift in combination aircraft.

William E. Downes, Jr., Commissioner of Aviation, City of Chicago:

I do not believe that the time has come for all cargo airports. I think it is in the somewhat distant future, if at all.

There are not over 20 cities in the United States being served by scheduled cargo flights. Cargo on these flights not only includes freight, but also mail and express.

The regularly scheduled airline operations carry passengers, mail, freight, and express, and it is felt that they will continue because they cover 200 to 300 cities.

Generally . . . air cargo operations are conducted at night. Passenger service, of course, is conducted mostly in the daytime and this arrangement will, no doubt, continue.

If there were an all cargo airport in any city, it would require dual ground operation, which would increase the cost and I see no reason for it.



WILEY



THEILE



DUNLAP

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AFTER THESE THREE YEARS, the Forty Four operating profit curve will climb steeply. The difference in profit potential for the following years is substantial.

Any consideration of a specific example requires certain assumptions regarding scheduling, future rates, and load factors, but, under a representative set of conditions our analysis indicates:—that a fleet of 25 piston powered aircraft currently being converted into cargo carriers, could be replaced and retired by a fleet of 8 Forty Fours. The above assumptions and statements are based on the unlikely premise that cargo rates will remain at present levels. If they are reduced, as seems inevitable, the situation will favor the Forty Four even more strongly.

THE FORTY FOUR. The Canadair Forty Four, with its combination of low direct operating costs, high block speeds and large payload capacity, is the world's most economical cargo aircraft. Delivery schedules can be arranged to introduce the Forty Four into airline service fourteen months from contract agreement.

CANADAIR LIMITED, MONTREAL, CANADIAN SUBSIDIARY OF **GENERAL DYNAMICS**

SEPTEMBER, 1960



Plane, Train or Limousine? *(none of these, this is a helicopter!)*

Looks like a conference room, doesn't it? Well, it is in a way. The cabin of this new turbine-powered Sikorsky S-62 was designed by Raymond Loewy to make every trip conducive to meetings, study, work and even rest.

The turbine engine not only contributes to this atmosphere with its smooth, quiet operation but also has an unequalled record of reliability to recommend it. And because the mechanical components of the S-62 have been proven in over 1,000,000 hours of flight, periods between overhauls are four to five times longer than would normally be expected of new components.

This nine-passenger, boat-hulled Sikorsky S-62 is the new-

est addition to the family of helicopters you so often see in the news transporting government dignitaries both here and abroad. As it does for them, a Sikorsky helicopter will cut your executives' traveling time considerably.

So today, jot a note to Sikorsky Aircraft on your letterhead and a representative will call to show how your company can gain in *business*, in *time*, in *executive power* and in *prestige* with a new Sikorsky S-62 executive helicopter.



A New World of Mobility by
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AIRLIFT

IISN'T OFTEN that management hires a consultant and gets much more than a lot of reports (good or bad) and a big bill, but the case of Riddle Airlines is a strange study in contrasts. Its consultant became president and principal stockholder voting 56% of outstanding shares.

What's more, the move has given the floundering cargo carrier a shot in the arm that could very well put it on the road to solvency.

Back in June, 1959, Riddle reported a year-end loss of \$2 million. This year, with Robert M. "Bob" Hewitt calling the shots for eight of the 12 months, the deficit was \$1 million. By next June, he is determined to report a profit of better than \$800,000.

Since taking over Riddle, the soft-spoken, seemingly easy-going Hewitt has been a tireless dynamo in whipping the airline back into shape. He has ideas, a plan. And he wastes no time putting them into action.

His first goal was to bid and get a Logair contract. He



"Bob" Hewitt: consultant turned president.

Riddle's Hewitt: Dynamo in Action

bid it and he got it and by the time its three-year term expires, it could amount to a \$25 million business. In the first year alone it will match or exceed Riddle's \$5.5 million scheduled freight revenues.

Hewitt's whole concept for Riddle focuses on diversification. He is convinced it is nearly impossible for Riddle to make money on domestic cargo alone or to attract the financing for new equipment that would insure a profit.

Logair was but one step. He earlier streamlined the carrier's operations, marketing and maintenance organizations to provide the most efficient lineup for the lowest cost. Then he mapped out his plan and step by step he is carrying it out.

Tackles transatlantic charter first

One of his first aims was directed at the transatlantic charter business. This got underway in June with DC-4s. With contracts in hand exceeding \$500,000 for June through September, Hewitt expects the current fiscal year will produce about \$1 million in revenues.

Next was MATS transatlantic business, an item now getting most of Hewitt's attention. Success in this venture will enable him to buy bigger and better aircraft for Riddle to the advantage of its domestic airfreight business as well as transatlantic passenger charters. It would also bring in about \$8 million in revenues.

In domestic freight charters, Hewitt conceived and launched his commercial "Logair" service knocking rates to 15¢ per ton-mile (average for scheduled freight is 20¢) and is presently negotiating a big deal with a major industrial firm. He figures charters will produce \$1 million in revenue this year.

Only open item on Hewitt's agenda is an entry into technical assistance program in South America and Africa. Although these have been preempted to date by large international airlines, Hewitt feels Riddle's experience in domestic cargo better fits the needs of under-developed countries and he is ready, willing and able to take on the assignment.

'Reasonable' rates essential

Hewitt minces no words in sizing up the cargo picture. "To be profitable, air cargo must be expanded at reasonable rates." He says the theory that all one has to do is cut

HEWITT'S SIX PATHS TO SOLVENCY

- Reorganization—action completed.
- Logair business—contract bid and won.
- Transatlantic charters—already in operation.
- Domestic freight charters—already in operation.
- MATS transatlantic contract—now being sought.
- Technical assistance programs—in future plan.

the rates far enough to develop the business is nonsense.

The idiocy of this thinking, says Hewitt, is borne out by the continuing trunkline pleas for higher passenger fares while they talk of lower cargo rates. As a talking point, he cites air express—a service that could hardly exist if price were the only determinant. Today Riddle will pick up, fly and deliver a 100-lb. shipment from Miami to New York for only \$9.70. Rail Express costs \$14.12 and takes days longer. Air Express runs \$35.80 with no better service.

"Basic airfreight rates today," says Hewitt, "are a give-away and the problem is that not enough people want it even at that price. Airfreight has to be built into the materials distribution system of American business—involve whole new concepts of inventory control, warehousing, stock minimums and production planning."

Airfreight needs salesmen

What airfreight needs today, he adds, is salesmen, real salesmen, not just friendly glad-handers who can persuade a shipper to change from airline A or B to Riddle. It needs men who can sit in the front offices of big industries and work with their planners in developing new concepts of distribution that will be faster, more flexible and cheaper. Hewitt, by the way, is looking for such salesmen right now.

Riddle, although it got its name from its founder John Paul Riddle, ironically has proven more than a riddle to the succession of managements that took it over and tried to make it pay.

With Bob Hewitt at the helm, it has become a do or die effort. From his first nine months' performance it looks like "do" and with his success it's a good bet the name Riddle will go by the boards too, in favor of one that will more appropriately reflect the diversity of the operation he is crystallizing. ■



Flight Propulsion



RB-66 modified to accommodate General Electric CJ-805-23C, has been flying since February, 1960. Aircraft recently completed cross-country tour.

Aft-fan Powered RB-66 Tours United States

EDWARDS AFB, Calif.—General Electric's turbofan-powered flight test Douglas RB-66 took off from here recently on a cross-country tour which gave aviation observers their first opportunity to see and hear General Electric aft-fan engines in action.

The tour was a continuation of flight tests begun in February, 1960, when two General Electric aft-fan engines powered the modified RB-66 in this country's first all-turbofan flight with American-made engines. The aircraft has demonstrated outstanding performance in subsequent tests.

During the tour, observers were able to study the aft-fan engine at close range. The design couples the aft fan with G.E.'s proven basic gas generator to provide up to 40 per cent more take-off thrust and an improvement in specific fuel consumption of up to 15 per cent over straight turbojet engines.

Following a non-stop cross-country flight, the RB-66 made its first stop at Farmingdale Airport, Long Island. Elapsed flight time of five hours 20 minutes included 30 minutes holding, let down through 20,000 feet of clouds to a 1500 foot ceiling, and three low-level flybys.

From Farmingdale, the RB-66 flew to Andrews AFB in Washington, D. C. where government officials watched the aircraft's performance at low altitude. Later, they had a close look at the CJ-805-23 engines with nacelle doors open.

At Wright-Patterson AFB the aft-fan powered test plane underwent close scrutiny by Air Force officials. Most of the comments concerned the short takeoff run and over-all low noise level of the aft-fan engines. Decibel readings

taken on the field further verified the intrinsically good noise level characteristics of the aft-fan design.

The test program also provided a demonstration of General Electric's 40-kva hydraulic constant-speed drive with aft-fan engines. The system provides constant input speed for the ship's G-E a-c electrical generators. The two units aboard the RB-66 are the units which completed General Electric's earlier turbojet flight test program. The same accessory package is used aboard the Convair 880 and 990.

Aft-fan engines like those presently powering the RB-66 are scheduled to fly this fall on the Convair 990 Coronado and early next year aboard General Electric's Caravelle VII. Other members of G.E.'s growing aft-fan engine family now being considered by the aviation industry for military and commercial applications are the 4000 pound thrust-class CF700 and the 22,000 pound thrust-class MF239. This engine and other military versions of the aft-fan engine benefit from a 90 per cent reduction of infra-red radiation over straight turbojets.

Following a final stop at Wichita, Kansas, the RB-66 returned home to Edwards AFB, California, to continue an exhaustive test program.

For additional details on General Electric's aft-fan flight test program, check GED-4117 and 4192. Information on constant-speed drive systems is available in GEA-6890, on the CF700 in GED-3986, and on the MF239 in GED-5005. For information on aft fan IR radiation check GED-5006. See coupon.

Strategic Air Command Records Triple Launch of GAM-72 "Quail" Decoy Missile

EGLIN AFB—A Strategic Air Command bomber has recorded a triple launch of three McDonnell GAM-72 "Quail" decoy missiles into free flight over the Eglin Gulf Test Range off the west coast of Florida.

This triple launch marked the first time a SAC crew has launched more than one "Quail" at the same time.

The diversionary missile, powered by a General Electric J85 jet engine, is designed for release in "coveys" of this kind in order to penetrate and confuse enemy air defenses.

The airborne decoys are mounted on special racks in the bomb bay of the eight-jet B-52G. Small fins remain folded around the body of the "Quail" until it is moved into launching posi-



J85 powered GAM-72 "Quail" diversionary missile simulates B-52 on enemy radar screens.

tion. This space-saving feature makes room for the decoys without interfering with other weapons carried by the SAC aircraft.

After launching, the missiles fly in different directions but at the same speed as the big SAC bomber—more than 650 mph.

Each "Quail" in free flight produces a "blip" on enemy radar screens like that of the mother aircraft. The enemy, confronted by a series of diverging blips, is faced with the problem of determining which is the real bomber.

Slightly more than 10 feet long, the "Quail" uses ingenious electronic equipment to simulate the massive B-52G on radar screens.

When testing is complete, SAC B-52G's will be equipped with several GAM-72 "Quail" as well as two powerful GAM-77 "Hound Dog" air-to-surface missiles.

For additional information on the J85's adaptability to missile and other applications, check GED-4095. See coupon.



Caravelle VII Powerplant Test Program Under Way

TOULOUSE, France—Aircraft #42, the General Electric Caravelle, has been completed at Sud Aviation's Toulouse plant. Scheduled for mid-summer delivery, the ship will become the first aft-fan CJ-805-23C powered Caravelle VII.

Meanwhile, around the world, -23 testing is under way at an accelerated pace. Here is a brief summary of tests under way or already completed.

At Toulouse, wind-tunnel tests of an 18 percent nacelle scale model and of a six percent Caravelle VII scale model have demonstrated excellent low-speed aerodynamic characteristics of the aircraft, nacelles, and thrust reversers.

At Amsterdam, the Netherlands, high-speed wind-tunnel testing has demonstrated excellent characteristics using an eight percent nacelle scale model and a four percent scale aircraft model.

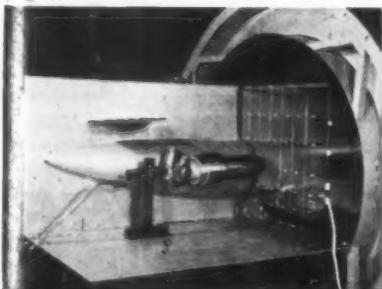
At Santa Monica, California, Douglas Aircraft is mating a Caravelle VII nacelle mock-up to a -23C mock-up delivered ahead of schedule. Work to date has confirmed ease of installation.

At Edwards Air Force Base, California, General Electric has completed tests using a 25 percent nacelle scale model mounted on a pylon under the wing of a flight test XF4D. Aerodynamic characteristics of the nacelle are excellent.

At Cincinnati, Ohio, static load testing of a -23C has demonstrated the engines capability to support the Caravelle VII nacelle. Thrust reverser configuration has been successfully tested using a 1/12th scale aircraft, nacelle, and thrust reverser model. At General Electric's Peebles, Ohio, facility, continuing test-cell runs are demonstrating -23C and thrust reverser performance.

For additional Caravelle VII information, check GED-4176 Caravelle brochure. See coupon.

Scale-model thrust reverser tests using 1/12 scale model of the -23C installation on the Caravelle have confirmed design configuration.



Diverted J85 thrust will power the Bell X-14 this year in a NASA test program.

General Electric's Small Engines Proving Versatile Power Source for VTOL Development

MOFFET AFB, Calif.—A variety of vertical takeoff and landing aircraft are now in development with versatile General Electric small gas turbine engines as the power source.

A lift-fan concept is being evaluated at Moffet Air Force Base, where a dry J85/lift-fan combination is undergoing wind-tunnel testing. J85-powered lift fans hold promise for a broad range of VTOL configurations with the capability of taking off straight up, flying forward at high speeds, and hovering.

In another program, diverted thrust from a J85 turbojet will power the Bell X-14, which NASA is using to test the feasibility of advanced propulsion and control techniques for VTOL and other future aircraft. X-14 flight testing is programmed for later this year.

General Electric's T58 turboshaft engine is the powerplant for two experimental VTOL aircraft which are scheduled to fly this year. Kaman's K-16 combines semi-tilt wing, deflector flaps, and cyclic-pitch propellers. The Fairchild M224 attains VTOL capability from deflected slipstream on the wing's trailing edge.

G.E. is also developing the T64 turboprop/turboshaft engine. Designed to operate continuously from 45 degrees below to 110 degrees above the horizontal, the T64 is especially suited for tilt-wing VTOL applications.

For additional information on the J85, check GED-4095. Check GED-3985 for T58 information, SAE-110A for T64 details. See coupon.

ENGINEERS—if flight propulsion engineering interests you, write to:

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Professional Placement Center
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New York, New York

FOR MORE DETAILED INFORMATION on these and other developments in General Electric products, contact your nearest G.E. Flight Propulsion Division representative or indicate below the brochures you would like to receive.

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- GED-4117 and 4192 "Progress Reports"
- GEA-6890, "Constant-Speed Drives"
- GED-3986, "CF700-1 Turbofan"
- GED-5005, "MF239C Aft Turbofan Power"
- GED-5006, "Aft Fan IR Radiation"
- GED-4095, "J85 Turbojet"
- GED-4176, "Caravelle VII"
- SAE-110A "General Electric T64"

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sengers the benefit and pleasure of modern jet-age transportation.

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FLIGHT INFORMATION A REAL PUZZLER

Why can't an airline customer dial a special number listed for "Flight Information" and listen to a tape recording—or a direct voice—advising the flight status of every schedule for the next three or four hours?

Made in an *AIRLIFT* editorial in July as a way to help the frustrated passenger find out whether his flight will operate in marginal weather, this suggestion drew widespread comment. *AIRLIFT* queried several industry executives; numerous unsolicited letters were received. Comments are summarized in this feature.

By Eric Bramley

INABILITY OF AIRLINES to give passengers up-to-date flight information quickly is a real sore spot. But it's a problem that has received considerable attention, and there are numerous ideas on how it might be solved.

Most officials admit there's plenty of room for improvement. They say use of recordings has merit, but that there are obstacles that must be overcome. One major carrier—American—tried this system and abandoned it, although admitted it may have given up too soon. Delta suggests that the industry get together and buy one electronic machine that would do the job for everybody.

American's use of recordings probably didn't work because the company didn't devote enough time and imagination to it, says R. L. Fitzpatrick, v.p.-sales and services. The system was discarded because (1) AA tried to put too much on the recordings and they were too long, (2) customer comments were negative because they couldn't talk back or discuss special problems, (3) some customers received old flight information at the exact time new information was being recorded for use.

"We have never dropped the idea of recorded flight information and I am hopeful that we can link it together with new ideas that will bring improvements that all of us want to see accomplished," Fitzpatrick states.

Supplementing these remarks, Karl Day, AA's director of dispatch, comments that the company hasn't yet come close to a workable answer. "I can assure you that we are prepared to spend a lot more bucks and a lot more talent to develop an answer, and the more automatic, the better. This is an invitation."

Keeping current information in a recorder appears to be the biggest problem, says O. C. Enge, United's v.p.-passenger service. UAL has special flight information trunks and answering positions at major stations, and although the procedure has been successful many customers still call the wrong number despite the company's educational efforts.

Computers demand speed

When UAL's Instamatic reservations system is in operation next year, flight information will be available to all agent sets. UAL will continue to consider recorders, but equipment must be available at reasonable cost and ways must be furnished to update information in the same manner and at the same speed as computers.

A smaller airline would have a hard time justifying an extensive flight information system, but all carriers serving a city could buy one electronic device into which each line could feed data for use in answering individual telephone inquiries, remarks Tom Miller, Delta's v.p.-traffic and sales. Result would be nominal expense and a real improvement in service.

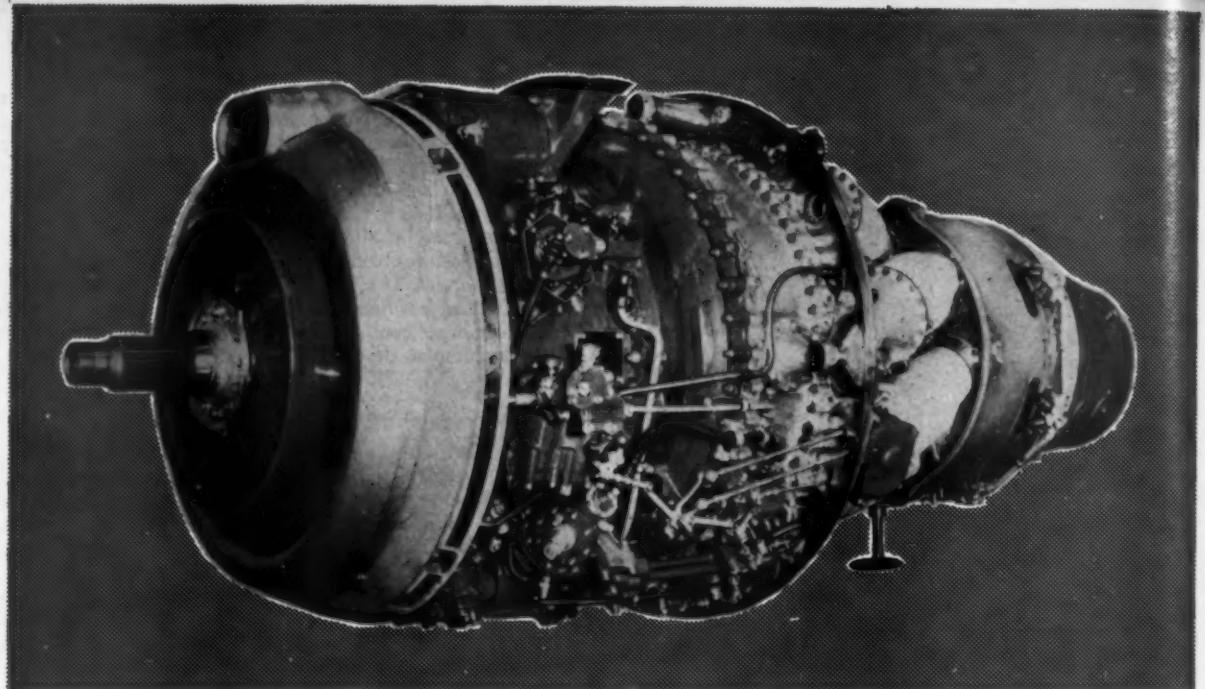
Robert L. Turner, Eastern's v.p.-customer services, says the company explored the possibility of using recordings, but decided the idea was not sufficiently flexible to meet changing conditions. In New York, EAL has put flight information on its Univac automatic reservations equipment and feels the results indicate some progress. It plans to expand this to include all flights on the system and to make the information available to other large cities. The real problem, according to Turner, is being able to cover tremendous peaks when the volume of information calls increases sharply.

Past investigations by TWA pointed out major problems in use of recorded announcements. But Clyde Fullerton, v.p.-sales service, says efforts are continuing to determine whether these problems can be overcome. Mark Kramer, Continental's v.p.-customer service planning, believes the recorder idea has a "lot of value," plans to pursue it further.

Manufacturer optimistic

An equipment manufacturer thinks a recording system could be made to work with little difficulty. Ed Brody, v.p. of Executone Inc., makers of communications systems, points out that American uses an automatic announcing procedure at Idlewild (*AIRLIFT*, June). Personnel at any gate dial a three-digit number which connects into the Executone/MacKenzie memory equipment, selects the proper recorded flight announcement and transmits it throughout the terminal. Little modification would be needed to ready the equipment for flight information, Brody claims.

However, he warns that "there is some reluctance on the part of telephone companies . . . to give consideration to this method." Airlines should "insist upon effective action by the phone companies and other reputable electronic specialists, using facilities already available to them, to resolve one of their serious problems." ■



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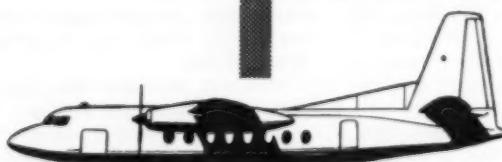
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TECHNICALLY SPEAKING

By Joe Murphy



Know your airfreight better. A third-rate federal airport policy. And at long last, some good news in fire detector development

Rhochrematics—Ever hear of it? Well, if you have anything to do with airfreight and its future, you'd better bone up. Since it isn't in the dictionary yet, a good place to start is a document put together by Prof. Stanley H. Brewer, University of Washington.

Gene Norris, Boeing's capable technical rep in Washington, gave us a copy and we think it's the best that has come across our desk on airfreight and materials distribution.

A good move—Britain's Air Registration Board has an important new assignment, one that has been glossed over too lightly in most countries. It will hereafter advise the Ministry of Aviation on the engineering competence of aircraft operators.

This is something a "Fast Buck" airline never heard of and has never been challenged on by Federal authorities.

Crackdown No. 2—ATA purchasing committee's airline "value analysis" team was so successful in its visit to a west coast valve manufacturer that it is eyeing its next victim: an east coast instrument manufacturer. Aim is to crack down on suppliers who aren't properly supporting their equipment in airline service.

This actually happened!—Overall transport design is usually good, but there must be a better way of convincing system designers that the littlest things can cause an operator big headaches. A good case in point: a 707 takes off from San Francisco, but can't get the gear up. Pilot dumps fuel and lands. Maintenance traces it to the L/G levelling cylinder and changes the "O" ring seal.

Back again for takeoff, probably two hours later. Takeoff, still no gear retraction. Dump more fuel (must be 25,000 gals. by now) and land again. This time ground crew changes the levelling cylinder, the flight takes off and all is well (theoretically). This is the kind of flight only system design engineers should be subjected to, not passengers.

Airport inertia—The U.S. is dropping way behind in federal thinking on airports. FAA's narrow view on a 10,800 ft. runway limit is one case in point.

At the same time deputy administrator Jim Pyle was emphasizing this point in a speech recently, Canada's transport minister proudly announced an 11,000 ft. strip for Edmonton, Alberta, "capable of handling the biggest and fastest aircraft the airlines will be using in the foreseeable future."

And while the FAA's own Chantilly project chugs along at a snail's pace, France works its bulldozers 24 hours a day to build an airport for Tahiti.

A new altimeter—Emerson Research Labs in Silver Spring, Md. is putting a healthy sum of its own money into development of a "poor man's" (airline) altimeter for jets. This is most welcome news considering the growing emphasis on all-weather flying and need for better altimetry.

Emerson has become a standout virtually overnight in developing altimeters for advanced military aircraft such as North American-Columbus' A3J Vigilante.

We'll never learn—Those fancy "pop-out" oxygen masks the U.S. legislated into jets probably will scare more pas-



Stairway to the Cockpit? Of course the 880 has stairs, see them? Consultant Al Gotch spotted them in Time and Dick Gottschall, Convair, matched the photo.

sengers out of flying by popping out at the wrong time than they will ever have a chance to help if and when an explosive decompression ever takes place. We think it's a thoughtless waste of money for which CAB and now FAA is responsible. The British wisely left them out, using portable oxygen to take care of emergency needs.

Items to watch—Two new fire detector developments. One by Don Steele, former Pratt & Whitney service rep, is doing a remarkable job both as a fire and smoke detector for Northeast Airlines on Viscounts.

No false alarms and only a handful of short ground delays due to burned out bulbs in 23,000 hrs. of operation. So good that Ed Schroeder tells us he is going to service test the system on engines. Steele's firm is Pyrotector, Inc., Hingham, Mass.

The other system is John Lindberg's (Berkeley, Calif.) which eased through a Pan Am test of 750 hrs. on a DC-7 and is now being installed in a 707. John says it's falsewarning proof. We'd hate to begin to estimate what false fire warnings on jets alone have cost the airlines . . . A new instrument now being tested shows good promise of displacing the "EPR" (exhaust pressure ratio) gauges for thrust measurement in jets. Developed by Industrial Acoustics Co., New York, it uses acoustical energy output as an index of power. A simple, direct-reading device. More on this next month.

Did you know?—Price of GE's fan engine for a Caravelle is \$200,000 but it's only \$199,000 for the Convair 990 . . . Atlantic Aviation's Lynchburg (Va.) division gives S & H green stamps for avgas and oil purchases. Imagine, a full gas load on a DC-4 would fill about five books! . . . You can now buy colored tires for aircraft thanks to a pigment called Hi-Sil developed by a Pittsburgh Plate Glass Co. subsidiary, Columbia-Southern Chemical Co. Watch the salesmen go with this one.

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SERVICE AND MODERNIZATION



From 100-hour check—to major overhaul—through Allison Prop-Jet conversion—PacAero has the men and means for the finest Convair service—around the clock

Convair operators the world over rely on PacAero for any and all of their service and modernization requirements, because PacAero—with the direct cooperation of Convair—has amassed more Convair conversion experience than any other firm, along with Convair-qualified personnel and specialized facilities. All PacAero materials and workmanship are warranted and certified. Result: PacAero assures your Convair the ultimate in service and modernization at minimums in cost and down-time.

PacAero is the exclusive source for Convair 340 and 440 conversions to quieter and more efficient Allison 501-D13 prop-jet power, as sub-contractor

to Allison Division of General Motors. This conversion boosts cruise speed by 80 mph, involves modifications of the aircraft's nacelle, systems, heating, air conditioning, controls, empennage and other areas.

Other PacAero services to Convair operators include: service and overhaul; design and installation of custom interiors; installation of radar, navigation, communications and specialized electronic equipment; fuel expansion; and exterior painting.

For around-the-clock Convair service, modification, or conversion, come to PacAero for the fastest and finest!

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A subsidiary of Pacific Airmotive Corporation, Burbank, California

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Other PacAero Specialties: On all multi-engine aircraft—design and installation of custom interiors; installation of radar, navigation, communications and electronic equipment; fuel system expansion; airframe overhaul and painting. Also, Lodestar modification to JATO boost; Learstar manufacture; Alternate fuel metering systems; Spraymat anti-icing, de-icing systems.

U.S. Airline Revenues and Expenses

2nd Quarter 1960 vs. 1959

This complete summary compiled by AIRLIFT Magazine from official CAB Records.

	Total Operating Revenues			Passenger Revenues			Total Operating Expenses			Net Operating Income		
	1960	1959	% Change	1960	1959	% Change	1960	1959	% Change	1960	1959	% Change
DOMESTIC												
American	\$ 107,932,094	\$ 95,857,974	12.6	\$ 97,387,543	\$ 86,419,294	12.7	\$ 99,443,347	\$ 85,278,112	16.6	\$ 8,488,747	\$ 10,579,862	-19.8
Brannif	19,804,287	16,349,359	21.1	18,196,848	14,889,607	22.2	18,569,737	14,760,196	25.8	1,234,550	1,589,163	-23.8
Capital	28,388,606	28,388,626	0.6	28,785,694	26,720,470	0.2	28,702,651	28,377,997	3.1	-143,045	550,629	.....
Continental	15,188,830	9,629,483	57.7	14,192,713	8,925,861	59.0	13,381,748	8,914,539	50.1	1,807,062	714,944	152.8
Delta	33,445,123	26,146,966	27.9	30,644,155	23,919,681	28.1	28,794,864	24,230,793	18.8	4,650,259	1,916,713	142.7
Eastern	61,632,889	70,173,244	-12.2	57,215,357	65,795,355	-13.0	66,815,930	65,932,040	1.3	-5,183,041	4,241,204	.....
National	17,388,840	15,754,095	10.2	16,136,811	14,312,136	12.7	18,465,430	15,626,272	18.2	-1,096,590	127,823	.....
Northeast	9,997,065	8,773,393	27.0	9,340,160	7,427,437	25.8	10,232,803	8,934,834	14.5	-235,738	-1,061,441	.....
Northwest	21,917,203	21,787,103	0.6	19,559,307	19,538,171	0.1	21,253,594	20,180,865	5.3	663,609	1,606,238	-58.7
Trans World	71,223,974	68,056,441	4.7	65,226,302	63,052,628	3.4	70,471,312	58,845,407	19.8	752,662	9,211,034	-91.8
United	89,285,514	84,155,189	6.1	78,583,803	73,662,039	6.7	84,221,000	73,268,097	14.9	5,064,514	10,887,092	-53.5
Western	15,257,375	13,347,106	14.3	14,142,472	12,408,952	14.0	14,440,101	11,045,647	30.5	817,274	2,281,459	-64.2
	\$491,612,800	\$457,518,979	7.5	\$447,411,171	\$417,071,631	7.3	\$474,792,517	\$414,874,799	14.4	\$16,820,283	\$42,644,180	-60.5
INTERNATIONAL												
American	\$ 1,652,437	\$ 1,573,181	5.0	\$ 1,401,397	\$ 1,301,197	7.7	\$ 1,742,585	\$ 1,694,996	2.8	\$ -90,148	\$ -121,815	.....
Brannif	2,775,983	1,977,718	40.3	2,377,139	1,658,120	43.3	2,812,493	2,016,536	39.5	-36,610	-38,818	.....
Caribair	852,256	676,795	25.9	779,995	622,901	25.2	776,182	585,650	32.5	76,074	91,345	-16.7
Delta	768,775	1,398,132	-29.3	907,427	1,284,644	-29.6	1,114,772	1,425,404	-21.8	-125,797	-27,272	.....
Eastern, Overseas	7,016,564	6,534,612	7.4	6,505,436	6,122,714	6.4	6,279,565	5,890,155	6.6	737,001	644,457	14.4
San Juan	5,174,608	4,537,687	14.0	4,766,605	4,264,429	11.8	4,411,838	4,110,652	7.3	762,770	427,035	78.6
Bermuda	727,129	768,714	-5.4	680,027	705,804	-3.7	507,463	593,600	-14.5	219,666	175,114	25.4
Mexico	1,114,829	1,228,211	-9.2	1,058,803	1,142,481	-7.3	1,360,264	1,185,903	14.7	-245,435	42,308	.....
National	354,477	978,239	-63.8	301,637	901,534	-66.5	523,922	938,328	-44.2	-169,445	39,911	.....
Northwest	9,543,421	10,347,785	-7.8	6,131,704	6,862,518	-10.6	9,213,061	8,233,146	-11.9	330,360	2,114,639	-84.4
Panagra	4,481,694	4,413,403	1.5	3,245,155	3,257,337	-0.4	5,126,295	4,848,574	5.7	-644,599	-435,171	.....
Pan American, System	105,682,230	90,458,962	16.8	84,544,657	70,083,744	20.6	95,138,749	84,349,576	12.8	10,543,481	6,109,201	72.6
Non-divisional	24,843,727	23,005,507	8.0	18,837,220	17,746,090	6.1	27,846,945	25,052,799	11.2	-3,003,218	-2,047,292	.....
Latin American	49,323,090	43,518,951	13.3	40,829,297	36,003,847	13.4	41,955,374	37,014,148	13.3	7,367,716	6,504,803	13.3
Atlantic	29,796,211	22,885,233	30.8	23,565,087	15,510,665	51.9	23,817,308	20,990,281	13.5	6,118,903	1,895,005	222.9
Alaska	1,579,202	1,049,271	50.5	1,313,053	823,142	59.5	1,514,022	1,283,045	18.0	65,180	-233,794	.....
Trans Caribbean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trans World	29,895,287	20,612,299	45.0	24,736,998	14,071,444	75.8	21,689,343	21,251,951	2.1	8,205,924	-639,652	.....
United	5,868,241	4,454,010	31.7	5,535,620	4,168,318	32.8	3,953,829	3,363,360	17.5	1,914,412	1,092,650	75.0
Western	1,235,803	929,925	32.9	1,171,343	876,617	33.6	1,087,298	995,980	9.2	148,505	-46,055	.....
	\$170,347,727	\$144,357,261	18.0	\$137,638,508	\$111,205,090	23.8	\$149,458,114	\$135,593,836	10.2	\$20,889,158	\$8,763,425	138.4
LOCAL SERVICE												
Allegheny	\$ 3,653,082	\$ 2,623,121	39.3	\$ 2,604,255	\$ 1,779,634	46.3	\$ 3,778,907	\$ 2,672,968	41.4	\$ -125,825	\$ -49,847	.....
Bonanza	1,751,884	1,448,376	21.0	1,096,270	954,401	14.9	1,845,945	1,619,788	15.2	-114,059	-171,412	.....
Central	1,379,852	1,343,830	2.7	627,883	588,781	6.6	1,432,271	1,357,339	5.5	-52,419	-13,509	.....
Frontier	3,673,518	2,130,395	72.4	1,552,104	1,258,992	23.3	3,337,766	2,655,797	25.7	335,752	-525,205	.....
Lake Central	1,242,015	1,182,790	5.0	751,829	682,569	10.0	1,203,282	1,075,104	11.9	38,733	107,886	-64.1
Mohawk	2,979,098	2,794,542	6.6	2,318,551	2,167,334	6.9	3,120,514	2,637,321	18.3	-141,416	157,221	.....
North Central	5,775,478	4,389,997	31.6	3,268,273	3,030,094	7.9	5,302,851	4,501,889	17.8	472,627	-111,892	.....
Ozark	3,492,475	2,757,854	26.6	1,992,847	1,940,579	2.7	3,158,898	2,624,410	20.4	333,577	133,444	150.0
Pacific	2,485,469	2,452,596	1.3	1,620,203	1,461,750	10.8	2,974,943	2,076,723	42.3	-89,474	375,673	.....
Piedmont	3,114,156	2,750,374	13.2	1,953,442	1,982,385	-1.5	3,066,031	2,964,935	3.4	48,125	-214,561	.....
Southern	1,473,928	1,530,077	-3.7	880,203	852,704	3.2	1,774,147	1,431,646	23.9	-300,219	98,361	.....
Trans-Texas	2,234,517	1,937,134	15.3	1,352,560	1,047,043	29.2	2,197,785	1,808,990	21.5	36,732	128,144	-71.3
West Coast	2,583,248	1,979,049	30.5	1,569,844	1,013,797	54.8	2,840,957	1,764,471	44.6	-257,709	14,578	.....
	\$ 35,838,722	\$ 29,320,245	22.2	\$ 21,588,264	\$ 18,763,463	15.1	\$ 36,054,297	\$ 29,391,581	22.7	\$ -215,575	\$ -71,316	.....
HELICOPTERS												
Chicago	\$ 997,126	\$ 753,645	32.3	\$ 528,612	\$ 299,877	76.3	\$ 830,539	\$ 570,741	45.5	\$ 166,587	\$ 182,904	-8.9
Los Angeles	379,990	360,240	5.5	62,429	66,273	-5.8	352,453	344,786	2.2	27,537	15,454	.....
New York	874,021	889,417	-1.7	288,468	235,875	22.3	909,185	837,539	8.6	-35,164	51,878	.....
	\$ 2,251,137	\$ 2,003,302	....	\$ 879,509	\$ 602,025	46.1	\$ 2,092,177	\$ 1,753,066	19.3	\$ 158,960	\$ 250,236	-36.5
INTRA HAWAII												
Hawaiian	\$ 1,246,413	\$ 804,044	55.0	\$ 1,181,146	\$ 754,262	56.6	\$ 1,261,015	\$ 779,739	61.7	\$ -14,602	\$ 24,305	.....
Hawaiian	2,829,268	1,876,517	50.8	1,629,451	1,446,309	12.6	2,717,463	2,001,225	35.8	111,905	-124,708	.....
	\$ 4,075,681	\$ 2,680,561	52.0	\$ 2,810,341	\$ 2,200,571	27.7	\$ 3,978,478	\$ 2,780,964	43.1	\$ 97,203	\$ -100,403	.....
ALASKA												
Alaska	\$ 2,056,030	\$ 2,144,920	-4.1	\$ 629,534	\$ 737,569	-14.6	\$ 2,015,588	\$ 2,099,891	4.0	\$ 40,442	\$ 45,029	-10.2
Alaska Coastal	539,702	638,420	-15.5	301,192	280,102	7.5	573,716	532,758	7.7	-34,014	105,462	.....
Alaska	317,526	299,451	6.0	43,312	36,642	18.2	308,944	291,280	6.1	8,582	8,171	5.0
Iliis	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
or. Consolidated	769,186	690,721	11.4	246,182	220,766	11.5	767,588	739,770	3.8	1,598	-49,049	.....
acific Northern	3,012,035	3,038,220	-0.9	1,944,705	2,031,044	-4.3	2,807,597	2,734,457	2.7	202,438	303,763	-33.3
se	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ian	1,586,518	1,295,674	22.4	305,122	275,384	10.8	1,255,916	1,303,240	-3.6	330,602	-7,544	.....
	\$ 8,280,997	\$ 8,107,406	2.1	\$ 3,470,047	\$ 3,581,507	-3.1	\$ 7,731,349	\$ 7,701,396	0.4	\$ 549,648	\$ 406,010	35.3

Domestic Losses Darken First Half for U.S. Trunks

A gloomy first half saw the 12 U.S. trunklines edge into the black by only \$2,963,819, a vast difference from the first six months of 1959 when net operating income on domestic and international operations reached \$55,633,192.

And if international results are not included, the picture is even worse, for on domestic routes the carriers showed

an operating loss of \$4.8 million against income last year of \$58.9 million—a spread of \$63.7 million.

Only five companies showed profits on overall operations, against 11 in 1959. Three of the Big Four were in the red. American's \$7.2 million net barely offset the others' losses, resulting in a \$203,472 profit for the group. Last year, all four were in the black for a total net of \$40.3 million. The 1960 results were adversely affected by Eastern's 11-day pilot walkout, while 1959 included an 11-day strike against American and two days for EAL.

ON TIME BOXSCORE

May 1960

On time to
15 min. late

Airline Ranking

TRUNKS

1 Western	85.3
2 Continental	82.3
3 United	80.8
4 TWA	80.4
5 Braniff	76.4
6 Capital	74.6
7 American	69.8
8 Northeast	69.2
9 Delta	68.6
10 Northwest	67.8
11 Eastern	61.6
12 National	43.5

707 & DC-8

1 TWA	74.5
2 Capital	74.4
3 Delta	68.5
4 American	66.2
5 United	46.2
6 Braniff	45.5
7 Eastern	16.1
8 National	12.3
9 Northeast	11.7

880

1 Delta	17.6
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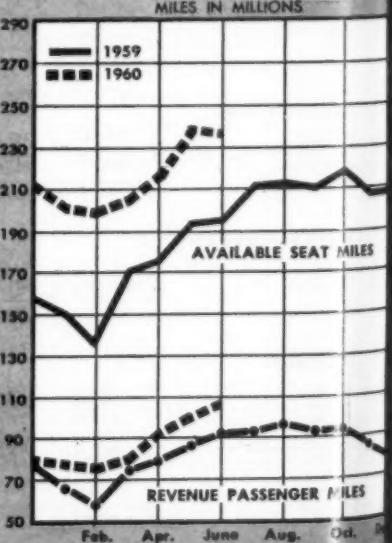
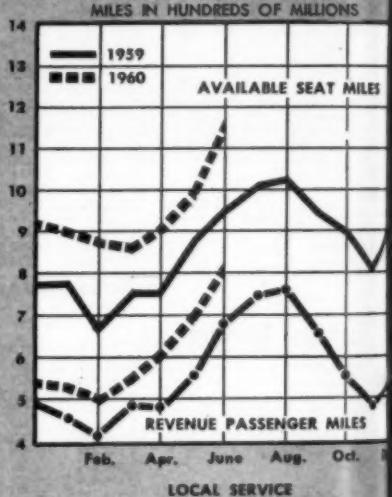
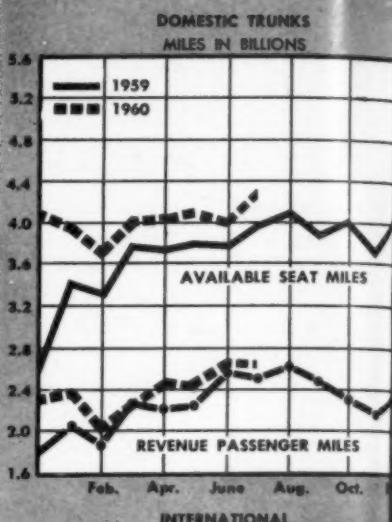
ELECTRA

1 American	91.2
2 Braniff	73.7
3 Western	71.7
4 Northwest	45.2
5 Eastern	35.5
6 National	33.3

LOCAL SERVICE

1 Central	92.3
2 West Coast	91.5
3 Lake Central	88.2
4 Frontier	84.8
5 Piedmont	83.2
6 Bonanza	78.1
7 Trans Texas	77.4
8 North Central	76.2
9 Ozark	74.8
10 Pacific	59.7
11 Mohawk	58.7
Allegheny	No Report on File
Southern	No Report on File

HOW'S TRAFFIC Among U.S. Airlines



Capital biggest loser

Smaller trunks fared better, with operating income of \$2.7 million against \$15.3 million last year. Biggest loser in this group was Capital. Showing larger profits this year were Continental and Delta.

Excluding international, the Big Four's domestic loss hit \$9 million, with only American profitable, compared with 1959 operating income of \$42.9 million. The other eight carriers netted \$4.2 million compared with \$15.9 million last year. Domestic operating revenues of \$937.8 million were up 9% while operating expenses of \$942.7 million jumped 17.6%.

International operations substantially improved TWA's position. Domestically, the carrier lost \$6.6 million, but with jets helping it regain Atlantic business, overall loss was reduced to \$722,151.

Financial results for the second half will be helped somewhat by the 5% fare increase, effective July 1. On an annual basis, the increase is expected to boost revenues by \$84 million.

Operating profits or losses for the first half:

Airline	1960	1959
American	\$7,213,768	\$ 6,792,489
Braniff	282,790	3,632,897
Capital	(4,966,625)	272,927
Continental	2,618,563	881,256
Delta	5,255,226	3,652,151
Eastern	(3,840,358)	11,974,961
National	2,051,640	3,491,216
Northeast	(1,427,694)	(1,376,973)
Northwest	(234,977)	249,790
TWA	(722,151)	5,192,433
United	(2,447,787)	16,318,713
Western	3,284,704	4,551,332
Total	\$2,963,819	\$55,633,192

Milestone: Coach Takes the Lead

U.S. Airline Traffic for June, 1960 vs. 1959

This complete summary compiled by AIRLIFT Magazine from official CAB data.

	Revenue Passengers (000)			Revenue Passenger Miles (000)		
	1960	1959	% Change	1960	1959	% Change
DOMESTIC						
American	785	710	10.6	612,847	541,558	13.2
Braniff	206	177	16.4	103,373	80,425	28.5
Capital	359	355	-1.1	153,398	145,290	5.6
Continental	124	101	22.8	88,765	60,631	43.4
Delta	312	262	19.1	170,620	132,400	29.0
Eastern	485	723	-32.9	244,577	384,725	-36.4
National	160	135	18.5	100,260	80,077	25.2
Northeast	149	109	36.6	56,894	41,881	35.8
Northwest	183	175	4.6	137,504	137,245	0.2
Trans World	479	477	0.4	443,449	441,389	0.5
United	708	674	5.0	523,398	498,650	5.0
Western	150	135	11.1	89,727	77,624	15.6
	4,100	4,033	1.7	2,723,412	2,621,895	3.9
INTERNATIONAL						
American	9	10	-10.0	8,871	9,573	-7.3
Braniff	6	4	50.0	13,382	8,156	64.1
Caribair	30	24	25.0	2,066	1,619	27.6
Delta	3	4	-25.0	4,514	6,071	-25.6
Eastern, Overseas	38	39	-2.6	55,766	56,346	-1.0
San Juan	31	30	3.3	48,538	46,467	4.5
Bermuda	4	5	-20.0	3,504	3,488	0.5
Mexico	3	4	-25.0	3,722	6,391	-41.8
National	2	7	-71.4	1,929	4,548	-57.6
Northwest	19	21	-9.5	34,372	39,096	-12.1
Hawaiian	2	3	-33.3	5,463	7,586	-28.0
Panagra	10	10	...	15,437	14,277	8.1
Pan American, System	303	274	10.6	493,087	448,803	9.9
Latin American	106	115	-8.3	131,439	133,565	-1.6
Atlantic	149	123	21.1	217,559	189,712	14.7
Pacific	39	30	30.0	135,050	119,294	13.2
PDX/SEA-HON.	4	2	100.0	11,045	5,833	89.4
Alaska	9	6	50.0	9,039	6,232	45.0
Trans Caribbean	15	8	87.5	23,797	12,910	83.2
Trans World	46	40	15.0	144,195	126,572	13.9
United	17	14	21.4	42,252	34,956	20.9
Western	4	4	...	6,972	6,677	4.4
	502	459	9.4	846,640	769,604	10.0
LOCAL SERVICE						
Allegheny	49	56	-23.2	13,741	9,863	39.3
Bonanza	21	20	5.0	5,388	4,820	11.8
Central	16	15	6.7	3,097	2,797	11.0
Frontier	30	26	15.4	8,120	6,782	19.7
Lake Central	22	20	10.0	3,556	3,250	9.4
Mohawk	60	51	17.6	12,165	10,078	20.7
North Central	92	89	3.4	16,403	16,088	1.9
Ozark	53	51	3.9	9,384	8,890	5.6
Pacific	46	41	12.2	10,458	9,127	14.6
Piedmont	42	46	-8.7	10,127	9,725	4.1
Southern	8	23	-65.2	1,365	4,015	-66.0
Trans-Texas	31	24	29.2	7,176	5,751	24.8
West Coast	36	29	24.1	8,744	5,546	57.7
	526	491	7.1	109,724	96,732	13.4
HELICOPTERS						
Chicago	32	20	60.0	534	367	45.5
Los Angeles	4	5	-20.0	133	153	-13.1
New York	15	13	15.4	289	240	20.4
	51	38	34.2	956	760	25.8
INTRA HAWAII						
Aloha	35	29	20.7	5,195	3,999	29.9
Hawaiian	48	44	9.1	11,125	14,885	-25.3
	83	73	13.7	16,320	18,884	-13.6
ALASKA						
Alaska	11	11	...	9,931	9,860	0.7
Alaska Coastal	7	7	...	704	488	2.3
Cordova	2	2	...	294	278	5.8
Ellis	7	6	16.7	403	363	11.0
Nor. Consolidated	4	3	33.3	1,149	1,164	-1.3
Pacific Northern	13	14	-7.1	13,884	14,583	-4.8
Reeve	2	2	...	1,381	1,896	-27.2
Wien	6	6	...	1,784	1,932	-7.7
	52	51	2.0	29,530	30,764	-4.0
ALL CARGO (Ton miles in thousands)						
	Freight			Total Scheduled		
	1960	1959	% Change	1960	1959	% Change
AAXICO	166,718	166,718	...	179,638	179,638	...
Flying Tiger	6,022,472	7,073,478	-14.9	6,112,791	7,180,454	-14.9
Kidde	1,648,887	1,755,021	-6.0	1,733,938	1,782,318	-2.8
Slick (C)	...	...	...	...	...	...
Aerovias Sud	476,406	530,908	-10.2	476,406	530,908	-10.2
Seaboard & Western	2,043,352	2,634,591	-21.7	2,559,477	3,104,348	-21.3
	10,211,319	12,160,716	-16.0	10,881,914	12,777,866	-14.8

Note: Hawaiian Airlines figures are scheduled services only. All others are all services.

Coach is now the domestic traffic leader. And its surge is bringing renewed requests that the spread between first-class and coach jet fares be reduced by raising the cheaper class rate.

For the first time, coach jumped ahead of first-class in July. Of total trunk traffic, 54.4% was in the lower-fare service, or 1.46 billion passenger-miles out of 2.69 billion. Less than half the available seat-miles were coach—2.08 billion out of 4.33 billion, resulting in a substantial 70.43% load factor. First-class showed only 54.44%.

Total traffic is disappointing—up only 4.3% in July over last year, and a gain of 7.2% for the first seven months. The July results continue the poor showing that extended through the second quarter. For the month, coach increased 17.8% while first-class dropped 8.1%.

The increasing coach percentage means a decreasing revenue yield per passenger-mile. Total revenues were helped somewhat by the 5% fare increase okayed by CAB on July 1.

Large and comfortable coach capacities of the jets are attracting both business and pleasure travelers. First-class New York-Los Angeles jet fare, including surcharge, is \$181.45 one-way. Coach is \$119.15, or only 65.6% of first-class. The \$62.30 saving is a big attraction.

Seeks coach fare hike

United Air Lines president W. A. Patterson wants CAB to allow an increase in a number of jet coach fares to 75% of first-class, arguing that there is an "unsound relationship" between the two tariffs. His views are shared by others.

The fare increase had little or no adverse effect on traffic, observers believe. Likewise, the increase had little to do with the continuing coach gain. This trend set in months ago, triggered by the jets.

Here are the carriers whose first-class traffic increased in July: Continental, up 4.2%; Delta, 9.3%; Northeast, 5.1%; Western, 1.7%. All others dropped: American, down 8.5%; Eastern, 20%; TWA, 10.5%; United, 5.5%; Braniff, 5.7%; Capital, 12%; Northwest, 11.6%.

Big coach gains were shown by: Braniff, 130.8%; CAL, 63%; Capital, 31.5%; AA, 27.3%; WAL, 26.7%; Delta, 23.3%; TWA, 12.3%. Small declines were EAL, 4.7%; NAL, .3%; NEA, .1%; NWA, 4.1%.

Wayne Parrish Reports to the Travel Industry:



"So Many Golden Opportunities to Sell... in SOUTH AMERICA"

As an aficionado of South America's unlimited beauties and opportunities ever since the time I first flew over it in 1940, I am constantly amazed at the way the Latin continent is developing every time I go down there. I am also impressed beyond measure by the opportunities for real "romance" travel selling that any part of South America presents to travel agents and airline traffic departments.

In the first place, there is no kind of traveler who couldn't find his heart's desire somewhere in South America.



In every South American city, quaint vignettes of iron-work and native crafts delight the tourist.

There are world travelers to whom Paris is old hat, who should see Rio de Janeiro—with its smartly gowned women, its fantastic luxury shops, its fascinating restaurants and night spots, and its unbelievable mixture of a vanished colonial civilization cheek-to-cheek with the most modern forms of progress. There are others who worship the new and sensational who "ain't seen nothin'" till they have seen Brasilia, President Kubitschek's material capital.

Quite close to home, there's Colombia, with its amazing "multiple climate" with the equivalents of Dallas and Montreal within half a day's drive; with its emerald treasure chest, its marvelous coffees, its orchids, its charming and handsome people.

Then for those who pine for historic days and swashbuckling sword swingers, there is Lima. Here's where the ghosts of the original conquistadores guide you through ancient palaces, and where charming ladies, old and young, sell you armloads of flowers in the Flower Market. Here, too, is where you wouldn't hesitate to pawn the baby's shoes for some of the silver treasures that are to be found in Lima's silvershops. Lima also is a place where you're sure to use up tons of film to bring home memories of the Indian women in their weird hats and their walking-flower-garden embroidered skirts.

I could go on about Rio and Lima alone for reams, but this would be unfair, for then I couldn't tell you about the sensational beauty of Buenos Aires; you wouldn't know about the relaxed good time of the riverboat rides across the River Plate to Montevideo, and the gorgeous laziness of a day on the beach at Mar del Plata. There'd be no mention of La Paz, with its opportunities for trout fishing on 12,000-ft. high Lake Titicaca, or of Asuncion, your base for expeditions into Paraguay—today's Wild-West-with-a-Spanish-accent.

Yes, there is business to be sold in South America! Speaking of business starts me off on another tangent, about the most businesslike town in the world. Anyone who thinks of the Latin businessman as leisurely and behind the times should spend a few days in the business community of Sao Paulo, whose skyscrapers prove that the newest in artistic design is quite compatible with completely businesslike practice.

Actually, I think everybody connected with airline traffic and sales owes himself a South American tour. Only by going down there could you understand what a delightful continent South America is—and how many opportunities it holds for travel selling—on business or for pleasure. Also, only by going down there can you enjoy all the good times and all the shopping opportunities you'll find in Latin-Land. There, my friends, are two wonderful incentives—why don't you book yourself down to South America now?



In Latin America Braniff serves Cuba, Panama, Colombia, Ecuador, Peru, Bolivia, Paraguay, Brazil, Argentina, and offers good connecting service for such important cities as Santiago, Montevideo and Caracas. Actually, Braniff serves more major cities in South America and the U.S.A. than any other airline.

The finest, fastest equipment you will find anywhere in the world is used on Braniff's South American routes. Such giant aircraft as the faster, finer Boeing 707-227, the El Dorado Super Jet, and the El Dorado DC-7C are flown exclusively by Braniff. The in-flight service, appropriately called "Gold Service," is the ultimate in travel elegance.

Write us today for information on how we help you build South American ticket sales. Colorful folders and sales material, of course—plus specific ways we help your travel customers get the most pleasure out of South American business or vacation travel. Tour Department, Braniff International Airways, Exchange Park, Dallas 35, Texas.



For sheer luxury and modern styling South America's hotels and resorts rival anything in the world.

Serving more major cities in the U. S. A. and South America than any other airline.

BRANIFF International AIRWAYS



J&H Proposes New Starter-Generator

Use of frequency changer would erase need for constant-speed drive in future transports

CLEVELAND—Jack & Heintz, Inc., a nameplate that adorns the engine starters of countless airline piston transports, is out to revolutionize the complex starting and electrical generating systems of upcoming new jets.

Armed with a promising new generator design and some clever engineering that converts it into a jet starter, the company is bent on leapfrogging its competitors in equipping new fleets now under negotiation. The main targets: the Boeing 727 and Convair Model 60 medium jets.

At J&H, the talk is all VSCF, which translated stands for "variable-speed, constant-frequency" power. Further reduced to operational language, it means a transport generator that will supply 400 cycle a-c power without using a special constant-speed drive between the engine and generator.

Boeing 727 first target

Add to VSCF the job now done by a jet pneumatic starter and the J&H system becomes a versatile new package for airline and airframe engineers to ponder. This they are now doing and the first big test is due imminently as Boeing and its 727 prospects select a system for the three-engine jet.

Hotly competing for the business is

the combination of Sundstrand and Westinghouse with a starter-generator system that employs a constant-speed drive (*AIRLIFT*, July).

A 2,500 hr. generator

In their sales pitch for VSCF, J&H engineers stress its advantages in improved reliability and ease of maintenance. The generator, a brushless design, uses a solid rotor. No rotating windings, commutators, brushes or rotating rectifiers.

At overhaul, which would take place every 2,500 hrs. instead of the usual 1,000, the only thing that would require replacement would be bearings. With expected improvements here, the time could grow much higher, J&H officials say. Other VSCF components would be rated for 5,000 hrs. between overhaul.

Instead of maintenance costs in the neighborhood of 38¢ per hour today, and this excludes constant-speed drive costs, maintenance of the new system is estimated at 20¢ per hour.

Serving double duty as a starter, VSCF not only dispenses with the present airborne pneumatic starter and crossover system (110 lbs. worth per engine), but also does away with noisy turbine-powered ground starters.

All that is required is a conventional

ground power supply of 75 KVA or higher capacity. This assumes a 15 KVA airplane load requirement aside from starting.

Spearheading the VSCF project at J&H is Keith Chirgwin, manager of research and development, who with L. J. Stratton, senior R&D engineer, started work in this field in 1956. In the past four years, J&H has spent \$750,000 transforming their research efforts into reality.

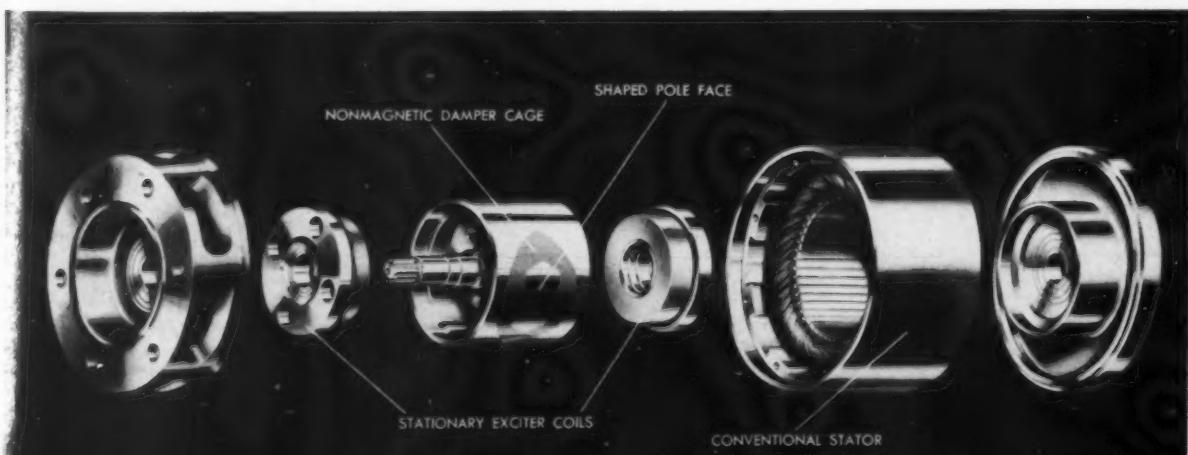
Missing link from GE

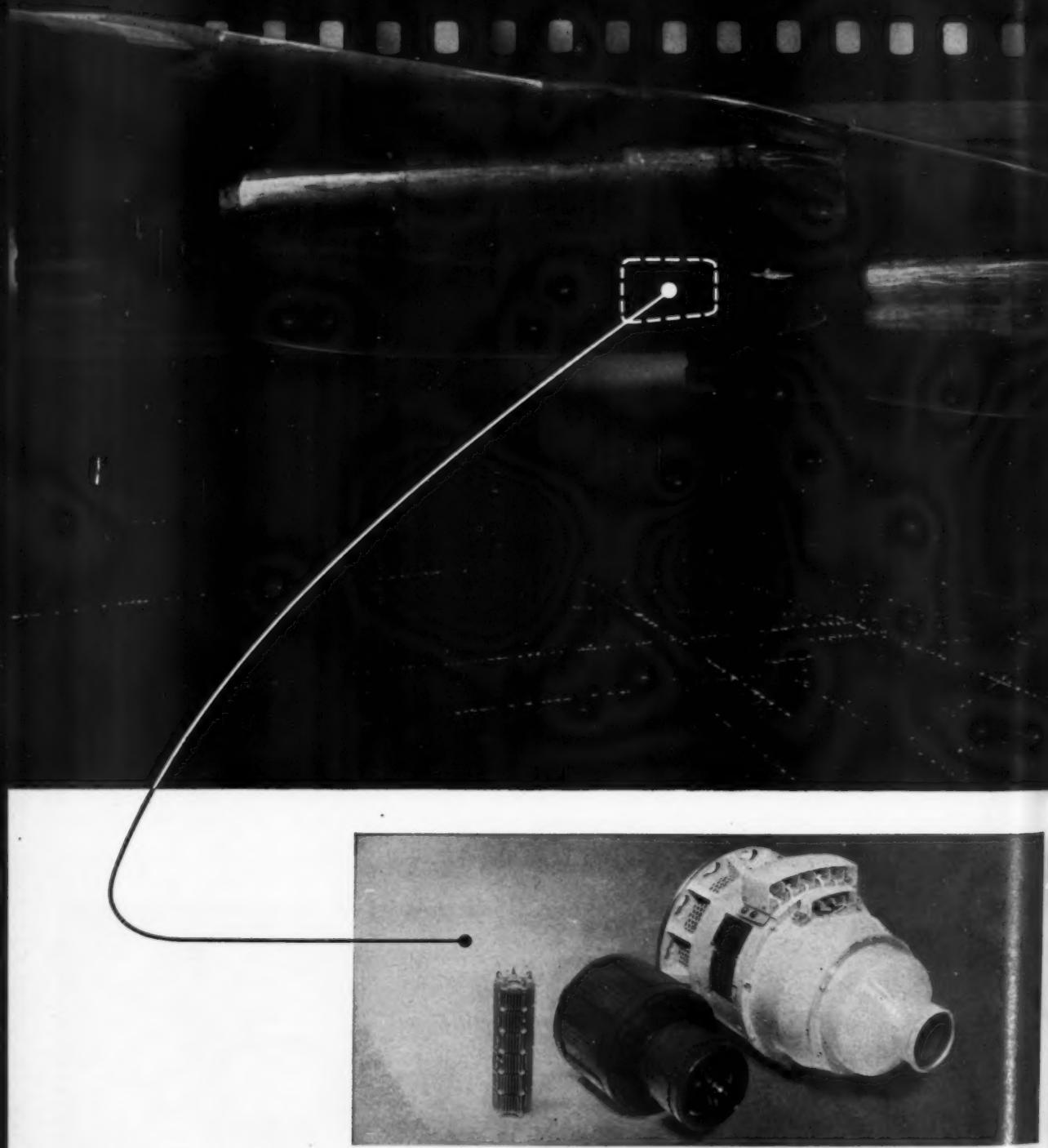
The missing link that made the system possible came with the availability from General Electric of a silicon controlled rectifier in mid-1958. It enabled the design of a frequency changer that would control the generator output frequency at 400 cycles regardless of variations in generator speed.

Although components supplied to date by GE have allowed demonstration of the system, controlled rectifiers rated at 400 volts/70 amps needed for the 40 KVA installation in a 727 won't be available until the first of next year. Besides GE, two other suppliers (Transistor and Texas Instruments) are but a few months behind in similar developments thereby promising a triple source of supply only one year from now.

This fits nicely into a schedule con-
Continued on page 53

Exploded view of J&H generator. Non-magnetic cage makes possible a solid rotor design, eliminates rotating windings.





GREAT RELIABILITY and longer service life result from elimination of sliding or moving contacts in Westinghouse brushless generating systems. A single rectifier bundle (left above) mounted within the rotor assembly (center) eliminates commutators, carbon brushes, and collector rings. High temperature silicon diodes, produced by Westinghouse research in semiconductors, make this possible.



Wherever they fly

Westinghouse Brushless Generators set amazing reliability records

Wherever they fly—in giant 707 commercial jet airliners, in supersonic jet bombers or sleek, light-weight jet trainers—Westinghouse brushless generators and complete electrical systems are setting unmatched records of dependability.

For example: In one airline's fleet of 707s, Westinghouse 30 KVA brushless AC generators, at the end of 1959, had accumulated 2970 hours mean time between removal. This is 3 to 5 times better than the service given by ordinary brush type generators.

On the same fleet of 707 aircraft, Westinghouse voltage regulators, designed with static components, have attained a reliability factor of 12,780 hours; control panels, with static circuitry, 6085 hours.

Behind this remarkable, trouble-free generator performance is the advanced Westinghouse *brushless* design, which features a rectifier assembly of high-temperature silicon diodes instead of the usual brushes, commutator and slip rings.

Write for complete information on these brushless generators and equipment, and advanced new constant frequency devices now in development. A. L. Paquette, Marketing Manager, Aircraft Equipment Department, P. O. Box 989, Westinghouse Electric Corporation, Lima, Ohio.



Westinghouse



PROVED IN SERVICE—Westinghouse brushless AC generators are produced for commercial jet airliners, and military aircraft such as the Boeing B-52H, Convair B-58, North American A3J-1, and Northrop T-38. Sizes range

from 8 KVA to 120 KVA—the world's largest aircraft generator—and both air cooled and oil cooled types are built. Many thousands of hours of trouble-free flight prove dependability of Westinghouse electrical systems.

J-02315

ATTENTION DC-8, 707 AND 720 OPERATORS:

Now undergoing airline service evaluation—

Champion's new jet igniters for JT3 and JT4 engines are doubling igniter service life!

As this ad goes to press, Champion's new AA37S and AA42S jet igniters are in airline service evaluation . . . and latest reports are that they have already exceeded twice the life of standard igniters—without severe electrical erosion!

A while back, the new Champion igniters were "torture-tested" in jet test cells. Their service life proved to be double that of standard jet igniters! Approval by Pratt & Whitney and the FAA followed.

But there's nothing like months of service evaluation—with competitive igniters—under actual airline flight conditions. And that's where things stand now: At this writing, airlines conducting service evaluation have substantiated test cell results—double service life with the new Champions!

This represents a major breakthrough in igniter

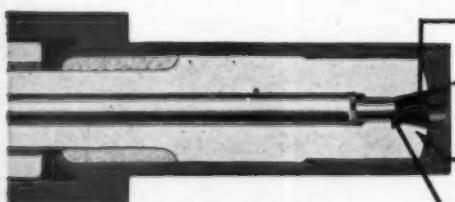
development . . . because no other igniters available for Pratt & Whitney JT3 and JT4 engines have anywhere near the service life of the new Champions! And this far longer service life is achieved under new engine operating procedures calling for continuous ignition for longer periods!

The "secret of success" is in the igniter's firing end, as shown in the illustration. The firing-end design, along with improvements in metals and ceramics, gives the new igniter its remarkably high degree of resistance to electrical erosion—resistance to the electrically charged inferno that chips ceramics and erodes metals.

The new Champion AA42S igniter is approved for the JT4 engine and replaces the Champion AA16S. The new Champion AA37S igniter is approved for the JT3 engine and replaces the Champion AA15S. And the new AA37S is the *only* igniter approved for the JT3D turbo-fan engine!

For specific details on up-to-the-minute service evaluations, call or write the Champion Service Department or check with your Champion district representative. *Find out how these two new Champion igniters can give you double the service life of your present igniters—or more!*

Design features of the AA37S and AA42S Champion jet igniters



SPECIAL FIRING CAVITY—This design aids in resistance to deterioration under severe, prolonged ignition.

PROTECTED INSULATOR TIP—A special nickel-chrome alloy protects insulator and coating from extreme combustion temperatures.

SEMI-CONDUCTING COATING—Reduces voltage requirements, particularly under continuous ignition conditions.

TUNGSTEN-TIPPED CENTER ELECTRODE—Provides high erosion resistance under all operating conditions.

DEPENDABLE

CHAMPION

SPARK PLUGS

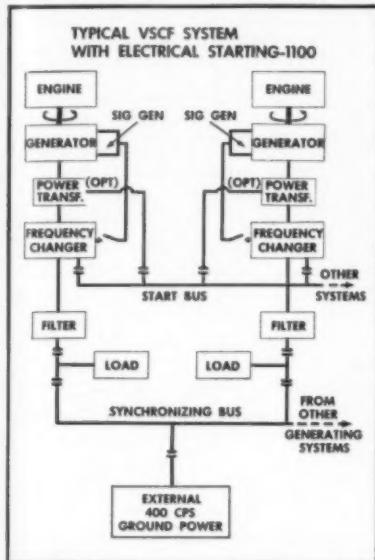
CHAMPION SPARK PLUG COMPANY
TOLEDO 1, OHIO

CHAMPIONS ARE USED IN EVERY MAJOR U.S. JET ENGINE

AIRLIFT

Continued from page 49
tentatively planned by J&H which would call for delivery of a prototype VSCF system in January of 1962.

The three major components of VSCF are the generator weighing 120 lbs. and measuring 11½" dia. by 12¾" long; the 36-lb frequency changer which measures 15" wide by 7.6" high and 19.6" deep and a filter (to smooth out the waveform) which weighs 22 lbs.



Block diagram shows location of components in proposed generator-starter system.

and measures 4.9" wide by 7.6" high and 19.6" deep.

For starting, power from the 400 cycle ground power unit would pass through the filter and frequency changer to energize the generator or "starter" and bring the jet engine to light-off speed in 25 seconds.

It would then automatically transfer to a power generating system flowing through these same components in reverse to supply the aircraft system or to provide power to start other engines.

Unlike present pneumatic systems that require operation of the engine at 80% power to crossfeed bleed air, the engine will supply the required power for starting while at idle speeds.

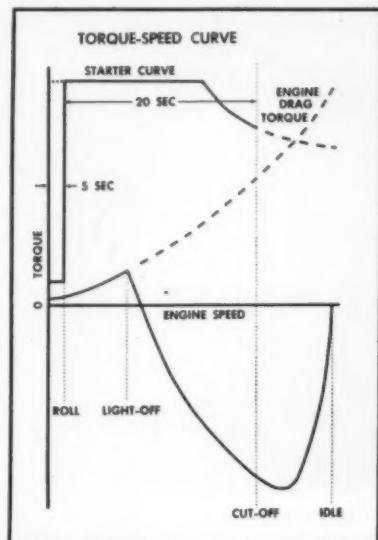
The VSCF project represents the most dramatic move yet made by J&H into transport aircraft generator systems. Although it developed the entire electrical system for Douglas on the DC-8, it stayed with conventional brush generators in that instance.

Now, under the leadership of new president and former USAF Maj. Gen. P. W. Smith, Jack & Heintz is out to get and hold a bigger share of commercial transport business. Although it has always had a good reception in this area in starters, inverters and circuit breakers, the starter market has taken a downward turn with the shift to jets. This gap is one the VSCF would more than fill if it lives up to the sales expectations of J&H engineers.

Although the 727 project is the im-

mediate target at Jack & Heintz, success or failure to get this business will not be a decisive factor in continued development of VSCF. J&H has other projects already underway employing its principles.

As to its eventual use as a combination starter and generator system for future jet transports, v.p.-sales and engineering Ralph Eschborn says a system like VSCF is bound to come. "It's inevitable."



Performance of generator used as starter; engine is brought to starter cut-off in 25 seconds.

UAL's Caravelle Meets Tight Schedule

First of 20 French jets ordered by United will fly in December. Delivery is set for April, 1961

TOULOUSE, FRANCE—The first of the 20 Caravelles ordered by United Air Lines is well advanced on Sud Aviation's production line here. It is scheduled to fly in December and will be used for an extensive flight test and certification.

This first UAL aircraft is actually Caravelle No. 62. Although it will be the first United aircraft to fly it will be the second delivered. Caravelle No. 86, United's No. 2 airplane, will be delivered first.

Here is the delivery schedule for the 20 plane fleet: No. 1, April 1961; Nos. 2 and 3, May; Nos. 4 and 5, June;

Nos. 6 and 7, July; No. 8, August; Nos. 9 and 10, Sept.; Nos. 11, 12 and 13, Oct.; Nos. 13, 14 and 15, Nov.; Nos. 16, 17, 18, and 19, Dec.; and No. 20, Jan. 1962. UAL expects to start Caravelle service in mid-summer, 1961.

Delivery at Toulouse

Delivery will take place at Toulouse and UAL is holding Sud responsible for certifying the aircraft and making delivery with a manufacturer's FAA certificate. On arrival in the U.S., probably at Newark, the aircraft will get its FAA airworthiness certificate.

UAL crews will ferry the Caravelles, probably making two refueling stops en route.

Certification should not present any great problems since the basic aircraft has already been approved. The FAA Paris office, headed by Robert Meyersburg, is working with Sud and the French government as well as with the UAL team in Toulouse.

This UAL team, under John Stern, is responsible for liaison between Sud Aviation and United's engineering headquarters in San Francisco. A direct telex enables questions to be asked and replies obtained rapidly. The time dif-



UAL'S CARAVELLE COCKPIT will have better visibility than that of previous models. This Sud Aviation mockup shows the deeper windshield, but does not show the additional glass areas at the sides of the cockpit.

ferential between France and the West Coast helps. Questions posed at the end of one working day in either Toulouse or San Francisco usually are answered by next morning.

Most messages refer to details since the main specification was firmed up several months ago. However, many equipment vendors have failed to realize this and take up much time of UAL and Sud Aviation officials in trying to get their equipment on the aircraft. "It is only since the UAL order was placed that some component manufacturers seem to have realized that the Caravelle exists," one Sud official comments.

In actual fact, equipment-wise UAL is taking the standard items proposed by Sud fitted on all previous aircraft. The main reason is that the equipment has proved entirely satisfactory in service. Another is that changes at this time would risk a delay in delivery.

Two major differences

This does not mean that Caravelle 6RU, the UAL version, will be the same as earlier Caravelles. It will differ in two important respects—the Avon engines will be fitted with re-

versers and the fuselage will have a completely new cockpit with improved visibility. The Avon 532 with reversers will give 12,200 lbs. thrust and subsequently will be uprated to the 533 at 12,800 lbs. The modification involves changing hot section parts.

Highest power yet

The 532/533 will be the highest powered engine yet put on the Caravelle. The UAL Caravelle will have the highest gross weight of any version yet built—110,000 lbs. Maximum zero fuel weight will be 79,367 lbs. and maximum landing weight 104,720 lbs. Sud Aviation is guaranteeing a speed of 441 knots in level flight at 30,000 ft. at a weight of 85,000 lbs.

Although the reversers will substantially improve landing performance, UAL has requested Sud to fit spoilers to further shorten landing field length. The only other major modifications of the basic Caravelle design will be to meet UAL's request for use of Skydrol. This will be a retrofit modification to be carried out in the U.S. with kits supplied by Sud. The UAL Caravelles will, however, be delivered with wiring and paints compatible with Skydrol.

In the cockpit, UAL is changing the instrument layout as much as possible to conform to its own standards. One UAL official at Toulouse put it this way: "We are trying to make the aircraft as compatible with our other jet models as feasible without taking a penalty in delivery schedule or in excessive cost." One significant change is that flight instruments will be internally lighted. Radio equipment is almost identical with that used in the UAL DC-8 with Collins equipment predominating. A Waste King flight recorder, the same as fitted in the airline's DC-8s and Boeing 720s, will be installed.

Interior gets attention

United is paying a lot of attention to the interior. In UAL service the aircraft will have double rows of seats providing accommodation for 64 passengers—all first-class. UAL does not go for a two-and-three five-abreast Caravelle seating configuration. An exceptionally comfortable new seat with foot rest and provision for oxygen in the back will be used.

UAL is accepting the standard reading lights and ventilators but has specified an improved central lighting system for the cabin with trough-reflector lights. It has specified three rows of anacoustic windows at the rear of the cabin but otherwise is taking standard soundproofing. UAL has asked that the windows on its aircraft have less distortion than on other Caravels.

In general the cabin interior will have "lighter and more pleasing tones" than existing aircraft, according to an airline official. U.S. materials will be used.

The specification calls for the standard Caravelle toilets located aft with provision for a third up front. The galley, to be manufactured by United in San Francisco, will be located up front.

U.S. manufacturers are supplying over 35% of the equipment in the UAL Caravelle. Britain's 20% contribution is mainly represented by the Rolls-Royce engines. The French equipment industry supplies about 45%. The airframe itself is 92% French with Italy's Fiat supplying the other 8%.

Apart from companies mentioned above, these U.S. manufacturers are supplying equipment: Bendix, Sperry, Edison, Thompson, Simmonds, Kidde, Fenwal, Kollsman, Sangano, Lewis Engineering, U.S. Gauge, Specialties Inc., Galbes Engineering, Airtronics, Sanders, MacMillan, Electro-Voice, Waste King, Cook Electric, Whittaker, Republic Manufacturing, Parker, Scott, Equipment Corp., Aircraft Mechanics, American Seating, Aerotherm, Meletron, WEMAC.

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THE BIG SWITCH IS TO



Seasoned air travelers are flocking to Delta's big jets . . . for the fastest, quietest and most luxurious flights ever! Watch the big switch grow, as Delta increases pure jet service to 18 cities in the U. S. and the Caribbean . . . and passengers continue to show their preference for the speed and comfort of Delta's big jets!



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CONVAIR 880 — cruises 615 mph, the quietest of all 4-engine jetliners.

DOUGLAS DC-8 — speeds of almost 600 mph, with deluxe or Supercoach on every flight.

**Now serving NEW YORK • ATLANTA • MIAMI • TAMPA • NEW ORLEANS
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Flight Recorder Market Rebounds

FAA insistence on turbine installations by Nov. 1 boosts business potential and inspires growth of new models

By PHIL GERACI

A burgeoning field for aircraft flight recorders has evolved in the wake of FAA's Nov. 1 deadline for installations in all turbine-powered aircraft. Carriers unable to comply by that date may receive an additional grace period of six months provided they can convince FAA of their honest intentions.

A year ago five recorders were entered in the race for airline business. That figure has grown to six, but two of the original contenders fell by the wayside and were replaced by three new entries. The present lineup: Waste King, United Data, Minneapolis-Honeywell, Lockheed Aircraft Service, Royston (now handled by LAS) and Spec Tool.

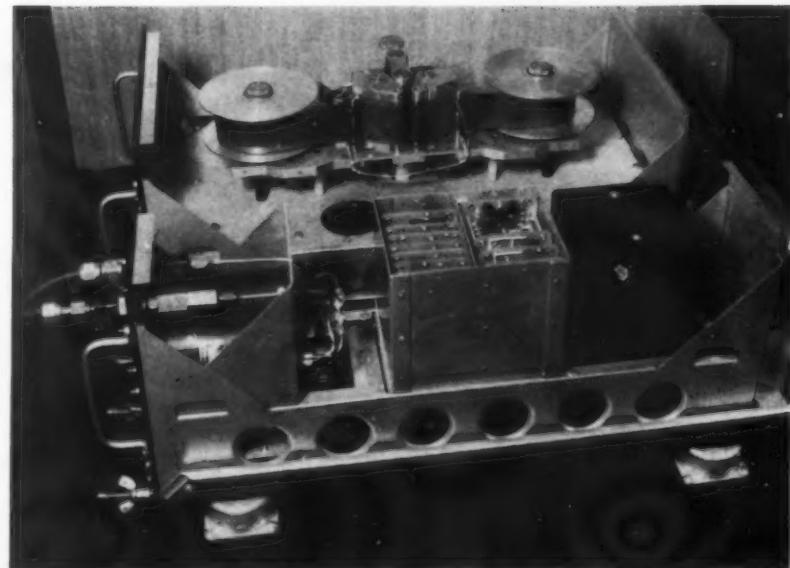
Waste King is turning out about 30 a month of its Model 5424, which is a 20 lb. foil recorder with an operational life of 200 hrs. per load. One side of a metallic-coated tape is adequate for the five FAA-required parameters (airspeed, altitude, heading, vertical acceleration and time). The other side is available for up to 20 additional channels of flight information.

The unit is priced at \$6,500. Thus far the company has sold about 300 units, but expects to boost monthly capacity to around 100 units as FAA's directive is implemented.

Lockheed Aircraft Service anticipates production of 184 units a month by the time this appears in print. To date, 526 units have been sold to 14 airlines.

109-C most available

The LAS 109-C is probably the most readily available recorder on the market. But it is not as sophisticated as Lockheed's recent acquisition, the British-built Royston "Midas" (which LAS refers to as the Lockheed Maintenance Recording System).



New on the flight recorder scene is the Minneapolis-Honeywell AG-8 which has capacity for FAA-required data plus 60 other bits of information per minute.

The 109-C records airspeed, altitude, heading, vertical acceleration and time with mechanically activated styli embossing aluminum foil tape. Although this satisfies FAA requirements for accident data, the recorder hasn't the capacity for comprehensive maintenance information.

At this stage of development, airlines are coming to view recorders as a means of complying with the regulations rather than as an answer to their operational recorder needs.

The LMRS is available in two models. One (Model 3D) records only three tracks at 45 parameters of information per track (one track must be used for a time code). The other, Model 7D, records up to seven tracks, a total of 315 parameters of information, each of which can be sampled every five seconds.

Model 3D fits one full and one half air transport radio case; the D7 takes two full ATR cases. Maximum recording time is up to 160 hours. Weight is approximately 40 lbs.

One feature of the LMRS equipment is ground playback at 100 times recording speed. This permits analyzing a three-hour flight in less than two minutes.

The LMRS unit will be available for delivery in this country in November. In England, Royston reports that at least one unit will be fitted in a BOAC 707 after the peak summer traffic season ends.

Following close on "Midas" heels will be a unit developed by Minneapolis-Honeywell and slated for release in December. Model AG-8 is a magnetic recorder which uses a 2-in. reel of tape to record the five essential



Waste King recorder is sophisticated unit capable of preserving variety of data on in-flight performance.

parameters once a second. It has one digital channel which can be used to sample (once a minute) 60 other data inputs.

Tape reels serve for 150 hrs. of recording. Price is expected to be under \$10,000, with delivery of 20 a month by January. Weight is 35 lbs.

Initially, M-H had given airlines a deadline in August for receipt of orders for 50 units as a minimum to kick off production. The company has since decided not to push output to meet the FAA "crash" program. Instead, M-H will enter into a program with several major carriers toward orderly evaluation and development, presumably with a view toward garnering a lion's share of the long-term maintenance recorder market.

Building-block system

Another newcomer is the building block system of United Data Control, Inc., 380 North Halstead St., Pasadena, Calif. which begins with a $\frac{1}{4}$ cubic ft., 16 lb., "FAA Only" unit capable of just the FAA-required five parameters, and which grows to 30 channels by the addition of more sophisticated circuitry. The miniaturized device can record up to 400 hrs. on a roll of metal foil.

The "FAA Only" recorder is the most recent outgrowth of United Data's ARINC 542 unit, as is the expanded 30-channel unit which collects engine

operation and maintenance information as well as the FAA requirements.

The youngest addition to this new family of safety instruments is the Spec Tool Company's "Marathon" magnetic tape flight data recorder. Spec tool, heretofore specializing in missile recording activities, is at 9626 East Beverly Road, Pico-Rivera, Calif.

Weighing approximately 29 lbs. it is

a spherical 13-in. OD (similar to the LAS 109-C). Nine data channels can be accommodated for 100 to 120 hrs. With automatic recycling, continuous recording time totals 2,500 hrs!

The unit sells for about \$5,900 but a sliding scale arrangement would drop the cost as low as \$3,600 if the company is successful in selling 100 units.

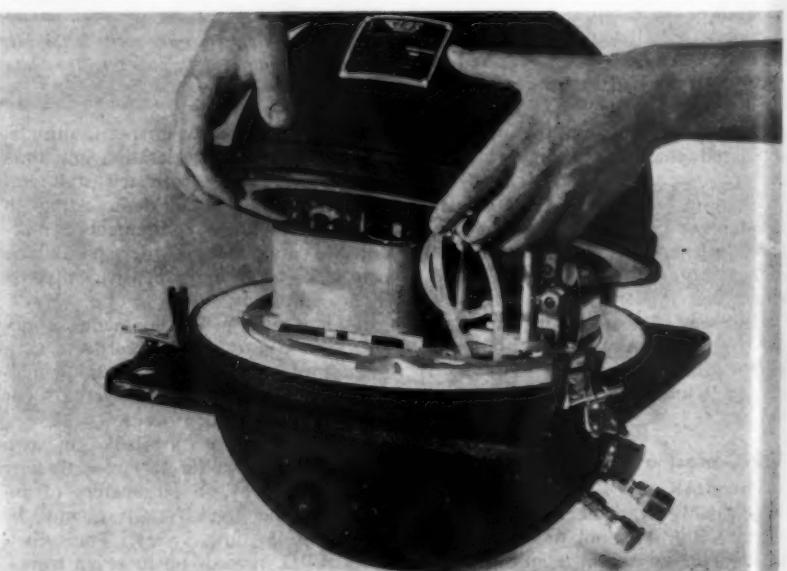
Northeast Airlines has ordered 16 units from Spec Tool. According to E. O. "Ed" Schroeder, NEA's v.p. technical services, the Spec Tool recorder choice was based on economy both of initial purchase and upkeep, in addition to the apparent advantage of the unit's ability to provide quick readout answers to conditions experienced in flight.

Northeast technicians figure they can adapt readout equipment to the Marathon unit for as little as \$3,000.

Lowest cost

NEA's estimates based on an order for 10 units plus six spares give the Spec Tool proposal a figure of \$90,000 compared to prices ranging from \$93,000 to \$160,000 for other recorders. Its annual maintenance cost was estimated at \$675, identical to one other unit but far below the \$4,000 to \$6,000 a year for other models.

Installation time on the NEA unit will be 41 manhours and elapsed time 16 hrs. whereas other recorders require anywhere from 48 to 60 elapsed hrs. to install. Northeast is asking FAA for approval of its recorder program including extension of time up to May 1, 1961 to fit the Spec Tool recorder into its fleet.



The Lockheed Aircraft Service 109-C was first model tossed into flight recorder ring. Now in full production, it will provide only FAA-required data.



Twenty-four hour service is available at both Aircraftsmen bases . . . (left) service ramp at the Will Rogers Municipal Airport in Oklahoma City, and (right) at Amarillo Air Terminal.



Norman Blake, President, heads up Aircraftsmen in Oklahoma City while Haskell Shaw (right) is manager of Amarillo Division.

Modern Facilities Highlight Aircraftsmen's Two-Base Operation

For "non-skeds", executive and private fliers who go in and out of Oklahoma City or Amarillo, Aircraftsmen means prompt service along with careful attention to details. At both their bases, Aircraftsmen offers Phillips 66 aviation lubrication oils and 80-, 91-, and 100-octane gasoline. In addition they handle grade 115/145 at their Oklahoma City ramp. Pilot lounges, hangars, tie-down, emergency maintenance by licensed A&E's, nearby FAA weather, and car rentals are also available at both Oklahoma City and Amarillo.

Aircraftsmen is also the Beechcraft sales and service distributor at Oklahoma City where they have extensive engine, airframe, and radio maintenance facilities. Under the direction of 8 licensed A&E's, Aircraftsmen's shop is generally acclaimed throughout the area for their certified propeller overhaul and majoring of Continentals, Lycomings, and Pratt & Whitney R985's. Their well-equipped radio shop does repair and installation on all makes of aircraft radio and electro-mechanical systems, as well as turning out the famous Aircraftsmen custom panels. Charter service with single and twin-engine Beechcrafts is also offered at Oklahoma City.



Aircraftsmen certified engine and propeller shop in Oklahoma City. Skilled mechanics and up-to-date shop assure top-quality work.



BENDIX BRAKES-

SURE GROUND CONTROL FOR 150-TON GIANTS

There's good reason why most of today's commercial and military jets rely on Bendix brakes. Products of the world's most experienced brake manufacturer, they are specially designed and

built to meet the extra-heavy ground control demands of these high-performance aircraft. In fact, "Brakes by Bendix" signifies safe, sure ground control—whatever the aircraft.

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ABOUT PEOPLE

IN THE AIRLINES



MOORE



SPRINGER

Gordon M. Bain resigned as v.p.-sales of Northwest, a post he has held since 1956. No reason was given for the resignation.

Robert F. Moore resigned as mgr. of Pan American's Miami overhaul base to become deputy v.p.-maintenance and maintenance engineer of Eastern. Capt. **Robert Springer**, TWA pilot who has served as operations director of the inter-

national division and Atlantic region, is EAL's new deputy v.p.-operations.

William C. Lawrence promoted from asst. v.p. to v.p.-development engineering of American. **Frank W. Kolk**, who is in charge of engineering research and development, elected asst. v.p., reporting to Lawrence. **W. H. Hall**, in charge of service engineering, elected asst. v.p.

Edward J. Crane elected corporate v.p. of Ozark and continues as comptroller and director of finance.

E. G. Erickson promoted from mgr. of operations engineering of Capital to director of engineering.

Josiah Macy Jr., asst. secretary of Pan American since 1953, elected secretary. **Henry C. Scott**, v.p. of recently liquidated West Indies Sugar Corp., joins PAA as gen. mgr.-hotel development.

Jack L. Cory promoted from asst. treasurer of Lake Central.

Henry G. Riegner, 20-year TWA veteran, named system director of advertising, succeeding **J. C. DeLong**, who retired to join an advertising agency. **W. L. Ben-**

nett

transferred from Kansas City to New York as mgr. of electronic reservations planning.

Capt. **Herb Farnsworth** named Delta's Atlanta base chief pilot in charge of jet training and Capt. **Jack Champion** appointed base chief pilot-piston engine training. Capts. **Jack McMahan** and **Herlong Everett** are new assts. to supt. of flight operations-training, in charge of first officers training.

Dale W. Rausch, formerly with Frontier, named mgr.-budgetary controls of Continental, and **Richard Barnett**, with CAL 12 years, appointed mgr.-economic planning.

Blake W. Schultz, Syracuse sales rep for American, fills new post of mgr. of express activities. **Jeanne Homm**, TV food stylist, named AA's mgr. of menu development.

R. Paul Day appointed industrial relations director of Ethiopian Airlines, transferring from employment mgr. of TWA, which furnishes management assistance to Ethiopian.

R. William Huggett, former Indianapolis

WWP Entertains Soviet Delegation



Five of the 10 Soviets, (L. to R.) Nikolai G. Porfirov, chief of Aeroflot's northern territory; Venedikt Markov, main administration; Ivan P. Antonov, chief engineer, main administration; Ivan A. Zhukov, department head, main administration; A. I. Rodionov, Soviet Embassy staff member.

During the recent visit of Soviet airline officials, *AIR-LIFT* editor and publisher Wayne W. Parrish brought the ten-man group together with U.S. airline and FAA notables at a reception at his home. Here is a picture report on the event.



WWP (right), wearing Russian shirt purchased in Odessa in 1955, greets top Soviet in delegation, Lt. Gen. Georgiy S. Shchetchikov, 1st deputy chief, main administration, USSR Civil Air Fleet. Interpreter Zarzhitskiy at left.



FAA, ATA and USSR. (L. to R.) Lt. Gen. G. Shchetchikov, H. Helfert, FA/; W. B. Becker, ATA and James T. Pyle, deputy FAA administrator. With back to camera, G. Zarzhitskiy, interpreter.

PREDICTION...



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PROVED SYSTEMS AND COMPONENTS FOR BUSINESS AND COMMERCIAL AVIATION

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SEPT

Aircraft will turn to the all-electric VSCF generating system

In reliability, life and operating economy, the Jack & Heintz all-electric Variable-Speed Constant-Frequency Generating System so far outweighs the conventional CSD-Generator scheme for power generation, that acceptance and incorporation of the VSCF on modern aircraft is inevitable.

Basically, the VSCF, as developed by J&H, can take either of two forms:

FULL-RATED FREQUENCY CHANGER: Entire variable-frequency output of a brushless generator is converted to constant-frequency power by feeding the v-f output through a frequency changer.

SYNCHRONOUS FLUX: Rotating field of a synchronous-flux generator is made to rotate at constant speed by superimposing field rotation from an integral frequency changer onto the field rotation produced by the variable-speed shaft.

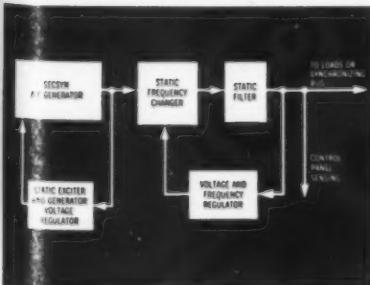
Regardless of which form the application dictates, final reliability, life and operating economy represent levels currently unavailable to airframe manufacturers or airplane operators:

RELIABILITY/ECONOMY—The only moving/wearing parts of the J & H all-electric VSCF are bearings. This design means much higher reliability. Based on current statistics, the VSCF will reduce maintenance/overhaul costs by more than 75%.

LIFE—Anticipated time between overhaul for a VSCF with oil-lubricated bearings is placed at 5000 hours.

The VSCF has still another major inherent benefit. The system can be employed for engine starting from an electric GPU, eliminating use of air-start equipment.

Block diagram of VSCF Generating System proposed by J&H for commercial jet aircraft. This is a Full-Rated Frequency Changer version.



stockbroker, named asst. to North Central board chairman Arthur E. A. Mueller, in charge of new stockholder relations program.

J. R. Reagan promoted by Piedmont from electronic section foreman to asst. supt. of communications, following resignation of Walt Rollick, now with Collins Radio.

John J. Corris promoted from central region public relations director of TWA to system director of press relations, New York. **Larry Murphy**, San Francisco pubrel mgr., takes over Corris' Chicago post.

John W. Hurt, former Transoceanic maintenance supervisor on loan to Iranian Airlines, named supt. of maintenance of Alaska Airlines at Anchorage.

Alan L. Morse, who was with CAA for 21 years and later with Allison Div. of General Motors, joined Lake Central as chief engineer.

AMONG THE SUPPLIERS



C. C. WOOD



SHOWALTER

Carlos C. Wood resigned as Douglas Aircraft's director of advanced engineering planning to become engineering mgr. of Sikorsky Aircraft. **M. E. Oliveau**, who organized Douglas' European division in 1946, is returning to his Geneva post. Oliveau, a v.p., was transferred to Santa Monica last June and **Edward H. Heinemann** replaced him in Europe. Heinemann resigned in July to become executive v.p. of Summers Gyroscope Co.

A corporate office of international operations was formed by Boeing at Seattle, headed by **N. D. Showalter** as v.p.-international operations. He was formerly special asst. to the senior v.p. Boeing promoted **William W. Coldren** from asst. advertising mgr. to advertising mgr.

Dr. Arthur Goldsmith, research asst. at Stanford while attending the Graduate School of Business and formerly with the Navy in communications and electronics, named engineering director of Wilcox Electric.

R. W. Harbison, gen. mgr. of Lear's service division, elected v.p.

Richard E. Palmer, former mgr. of contract administration, named mgr. of The Garrett Corp.'s AiResearch Mfg. Div., Los Angeles.

R. M. Kendall leaves post of gen. mgr. of Rolls-Royce of Canada to become gen. mgr., sales and service, for Rolls-Royce aero division, England. **James Wood**, in charge of aero division's technical sales, appointed v.p. and gen. mgr. in Canada.

Robert W. Brattvet, with B G Corp. 12 years, named v.p.-sales, engineering and quality control.

T. Gilbert Dunkin, formerly with Avro



PALMER



WOOD

Aircraft Ltd., appointed asst. mgr.-sales engineering of Canadair.

H. R. Saviers promoted by Goodyear Tire & Rubber to chief engineer for aircraft tire design.

W. J. Weisbruch, former supt. of Lockheed Aircraft Service Ontario, Calif., base, named mgr. of Oakland, Calif., base.

IN THE AGENCIES

Enar B. Olson appointed acting mgr. of FAA's Oklahoma City Aeronautical Center, filling post left vacant by death of **Fred Lanter**. Olson has been supt. of schools at the center. **Chester W. Wells**, transfers from Kansas City regional office to become asst. mgr.

FAA named the following chiefs of air traffic management field divisions: **Wayne Hendershot**, New York; **Paul H. Boatman**, Ft. Worth; **George W. Kriske**, Kansas City; **L. Ponton de Arce**, Los Angeles; **Gerald A. Whittaker**, Anchorage; **Donald H. Long**, Honolulu.

Col. William S. Cowart Jr. retired from the Air Force and from his FAA post as head of National Aviation Facilities Experimental Center, Atlantic City, to become administrative asst. to executive v.p. of Atlantic City Electric Co. **Donald G. Schuler**, Cowart's deputy, is serving as acting chief of NAFEC.

AIRLIFTS

• **Toast to El Al Israel**, and to its agency Doyle Dane Bernbach for gaining air transport recognition in Julian Watkins' "100 Greatest Advertisements" (Dover Publications, 180 Varick St., N.Y., \$2.25). Its ads on shrinking the Atlantic Ocean by 20% with Britannias and "What a Travel Agent Does for You" did the trick. Only other air transport ad in the book is a 1928 Ford advertisement (N. W. Ayer) billed as the first ad of the first ad campaign ever to sell the public on air travel.

• Considerable confusion resulted in Greenville, S.C., recently when Eastern's flight 580 arrived from Atlanta, with one customer fewer than ATL's headcount had indicated. GRL's concern arose from the fact that 580 is catered there. Querying ATL on the longline, GRL was told: "Sorry, but we sold an extra seat to a customer carrying his bull fiddle." Replied GRL: "We're sorry, too. We just boarded a meal for the fiddle."

CARAVELLE

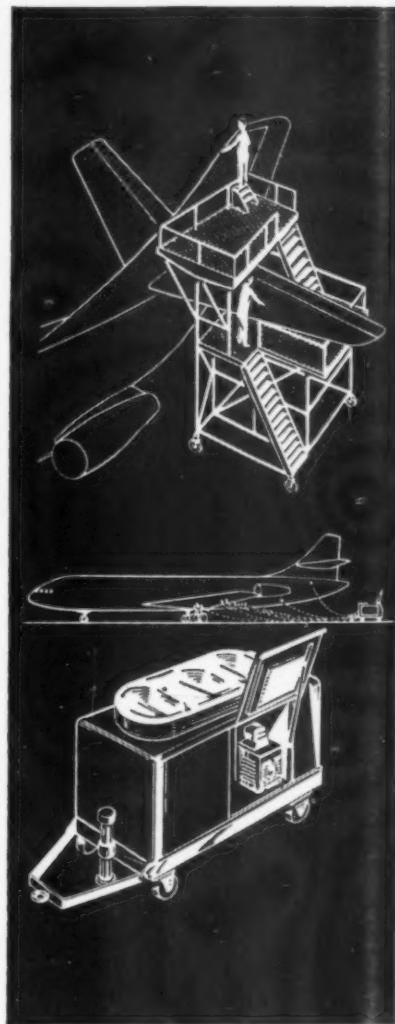
The finest medium range jetliner the world over

Now
backed by
Douglas
world-wide
product
support

The Caravelle has already established an outstanding record in Europe for trouble-free operation, with seat-mile costs well below those of other airliners.

Now this profit-making ability is assured wherever this fine jetliner flies, as Douglas service keeps ground time to a minimum. Douglas will provide customer and field service, maintenance and field training programs, and parts support in accordance with Douglas standards.

Douglas support of the Caravelle is in line with its long-standing tradition of prompt and permanent service to airlines throughout the lives of their aircraft.



*Designed and built
by SUD AVIATION*

*Sold and serviced
by DOUGLAS AIRCRAFT*



FAA's Big Weak Spot Starts to Show

Lack of top maintenance man hurt CAA and is hurting more than ever in FAA

THE MOST GLARING WEAKNESS in an otherwise healthy and flourishing Federal Aviation Agency is being brought sharply into focus.

The sore spot is maintenance—aircraft maintenance, engines, airworthiness directives, overhaul periods. Their administration has never been strong, but what was formerly a tolerable weakness in a generally weak CAA is becoming a serious ailment in a new powerful FAA.

The crux of the problem, as basic lack of top level understanding of airline maintenance in FAA, is fast approaching the fiasco stage. Top industry maintenance and engineering officials, following the recent "walk-out" from a specially-called FAA session for want of advance information on the topic to be discussed, fired back with a volley of stinging criticisms of FAA maintenance management.

FAA's method doubtful

United Air Lines' W. C. "Bill" Mentzer seriously questioned whether FAA is properly evaluating what is appropriate for the development of air commerce as well as what is necessary for promotion of safety.

There has been an increasing tendency, says Mentzer, for FAA to delve deeply into how each airline performs its work instead of evaluating the end

product. Taking no issue with FAA's basic objectives, he stressed that the manner in which the objectives are met is not the responsibility of a government regulatory agency.

Mathematicians, not judges

Hitting at the drive by FAA maintenance chief Omer Welling to establish unrealistic maintenance standards, Mentzer said industry's first taste of this device in regulating overhaul periods makes it clear that FAA is attempting to substitute questionable mathematics for judgement.

Mentzer states flatly that the biggest concern arises from the state of FAA-industry relations in recent months. Although meetings have been held and proposals offered, airlines are not convinced that there has been any receptivity to their thoughts on the part of FAA. There is every indication FAA has reached its final decision before a meeting is held.

TWA's R. M. "Ray" Dunn, struck hard at FAA's arbitrary, unreasonable and unilateral action which he says can only detract from aviation safety. Citing the Turbo Compound overhaul period restriction as a glaring example, he enumerated six successive meetings with FAA that produced no results.

By implication, Dunn also hit at empire building tendencies within FAA to

take over the engineering and technical roles performed to date by aircraft manufacturer and airline engineering staffs. He warned that these resources couldn't be matched even if considerable manpower were available, that the sheer load of such technical direction would be impossible to bear.

Dunn warned of the absolute necessity for mature and responsible maintenance administration in FAA. Careless and capricious use of authority can unnecessarily ground transports with serious disservice to the public. He urged Administrator Quesada to establish clearly who is authorized to issue FAA maintenance and airworthiness directives and to establish safeguards against improper use of such authority.

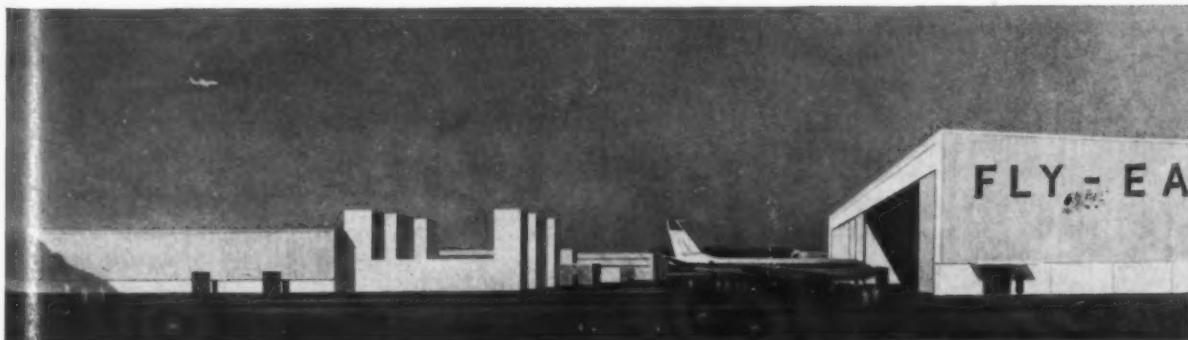
A Simple Fix for Ashtrays

American Airlines has come up with a simple solution to the problem of ash tray cover handles that come loose on new turbine aircraft. Glue the handle screws in with Loctite Sealant No. C4-1 made by American Sealants Co., Hartford, Conn.

GE Process Cleans Jets At One-Third the Cost

General Electric overhaul technicians have perfected a five-solution process for cleaning jet engines (of any manu-

Eastern's Planned Miami Overhaul Base



HOW THE ARTIST sees new \$14 million jet aircraft and engine overhaul base soon to get underway in Miami for East-

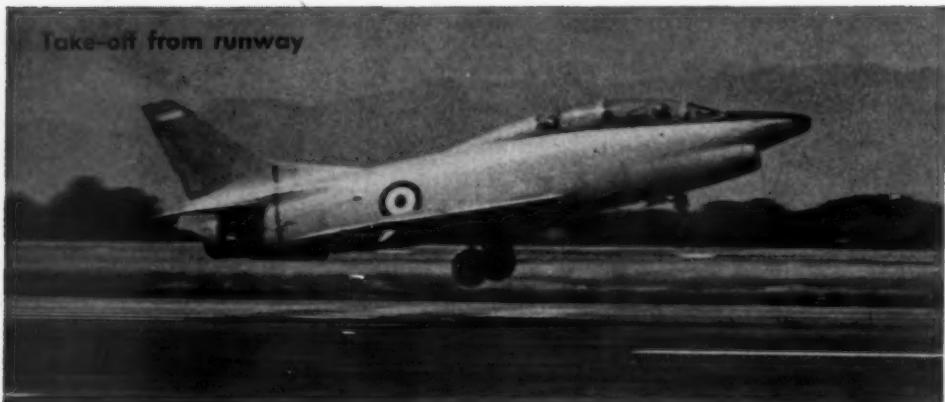
ern Air Lines. Engine overhaul shop (left) comprises 200,000 sq. ft. Hangar (right) will house eight DC-8s and meas-

ures 683 ft. by 360 ft. When completed in early 1962, EAL will overhaul P&W JT4 jets and Allison turboprops.

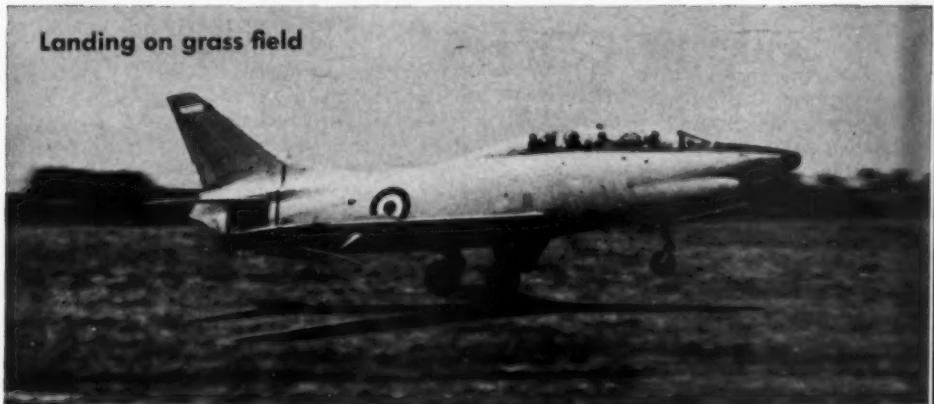
FIAT G 91 T

BRISTOL SIDDELEY ORPHEUS 80302 ENGINE

Take-off from runway



Landing on grass field



This is the jet-trainer which preserves the features of FIAT G 91 single-seater, NATO's L.W.F. It trains pilots for supersonic flight through subsonic and transonic flying stages. Trained on the G 91 T, pilots can start right away their activity in the combat organizations.

A single airplane for school, training and combat.

The similarity to the single-seater fighter not only permits the complete course and training but also the combat use in ground attack and armed reconnaissance missions.

Main Features and Performance

DIMENSIONS		FLIGHT PERFORMANCE	
Wing Span	28.25 ft.	Speed	transonic
Length	38.32 ft.	Climbing times:	
Height	13.94 ft.	— to 13,000 ft.	4'30"
Weight	11,794 lbs.	— to 26,000 ft.	8'
		Range	700 N.M.

FIAT-DIVISIONE AVIAZIONE—C.50 G. Agnelli, 200-TURIN (ITALY)

facture) at one-third the cost of other available methods. It enables an airline to use a single process for all jet cleaning and requires no special equipment to do the job.

The five solution process, supplied through Herbert Chemical Co., Cincinnati, includes these special cleaning chemicals:

- a chromic-phosphoric acid
- a sequestered inorganic alkaline solution
- an alkaline permanganate
- a mixed inhibited inorganic acid
- a non-ionic organic alkaline

PAA Salvages PRT Parts

Pan American's Miami engine overhaul shop has adopted an employee suggestion that is netting the airline longer-life operation of power recovery turbine fluid coupling runners in its Turbo Compound engines.

Based on a silver brazing procedure suggested by mechanic G. D. Perales,



Mechanic Perales shows PRT part that brought \$500 award.

Pan Am's shop no longer scraps the runners after an average of four over-haul cycles. Cracked vanes are repaired and returned to service at a substantial saving in cost. The idea brought Perales a \$500 suggestion award.

SNECMA Is Western Europe's First Contract Jet Shop

France's SNECMA, by trade a builder of jet engines, is geared up and in business as a commercial overhaul center for airline turbines.

As part of a broad diversification program which also takes in electronics and atomics, the company is now set to handle a capacity of 40 P&W JT3 or JT4 overhauls per month and could

expand that figure to 60.

A major portion of the Boulogne-Billancourt plant, situated a few miles east of Paris, is committed to jet over-haul activities.

Presently working on a two-shift basis, the SNECMA facility is capable of turning out military or civil counterparts of these P&W jets in 28 days or about 800 shop hours per engine.

This cycle will soon be reduced to 21 calendar days or 18 working days. At Billancourt the company is equipped to handle the entire overhaul process except for test stand operation. Once overhauled, engines are transported to

SNECMA's facility at Melun-Villa-roche for test and delivery to customers.

On the customer list to date, in addition to the French Air Force, are the three French airlines—Air France, TAI and UAT. Together they will be operating a fleet of 22 Boeing 707s and Douglas DC-8s, which adds up to 88 jet engines in service at all times.

SNECMA's first non-French airline customer, Aer Lingus, has already signed up for overhaul of the JT3s in its 707s. Company officials feel that other flag carriers, faced with the prospect of heavy shop investments to

Continued next page

Flight Proven AIRCRAFT SMOKE DETECTION SYSTEM . . . **PYROTECTOR**

Proven by more than 30,000 flight hours in airline and corporate aircraft without malfunction, the Pyroector Smoke Detection system represents a giant step forward in the safety of air travel. Through light reflection principles, Pyroector units actually "see" smoke in unguarded areas, and give an alarm before combustion can reach dangerous proportions. As many as six detectors may be connected to one control unit, providing protection for several different baggage and equipment areas with one system. This proven system assures 100% aircraft smoke detection.

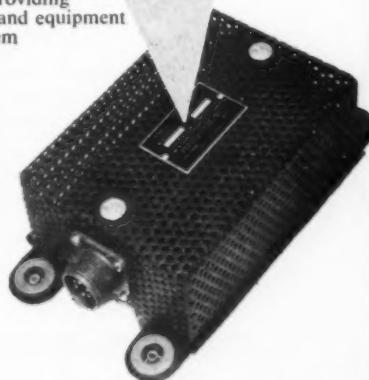
APPROVALS

The smoke detection system is certified and approved to FAA, TSO, C1a specifications for "smoke" detection. Pyroector also manufactures visual detection systems for engine protection, certified and approved to FAA specifications. Write today for complete details. Dept. W
DISTRIBUTED BY: Van Dusen Aircraft Supplies, Inc. • Mid Continent Airmotive Corporation and Pacific Airmotive Corporation.

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INCORPORATED

Hingham Industrial Center • Hingham, Mass.



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If you are responsible for airlifting cargo or making vital decisions about freight shipments, you will find AIR CARGO one of the most valuable shipping references you can have.

AIR CARGO—The Official Reference of the Scheduled Airlines—covers in depth all aspects of this growing industry. It reports current airline cargo schedules, embargo and regulatory information *plus* important facts on air freight, air express and parcel post. And it contains the U. S. and Canadian Station Directory.

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overhaul the jets, will follow suit.

As a final source of potential business, the company also looks to U.S. and other non-European carriers for overhaul work as a means of slicing the high costs involved in shipping engines over long distances to their own overhaul facilities.

Hot Wire Stripper

A handy wire-stripper developed by W. M. Ziegler, a senior mechanic at American Airlines' Tulsa instrumental and radio shop, takes all the work out of stripping Teflon covered wiring.

Ziegler's device, which won him a \$35 suggestion award, resembles a



soldering iron with two holes in the head. Wire is inserted into the holes and the heat of the tool melts the insulation with no chance of damaging the wiring. Previously, AA used mechanical strippers.

Epoxy Floor Beats Concrete

TWA testing of epoxy resins shows promising results for coating engine shop floors that are subjected to loads ranging from 10,000 to 15,000 psi.

In the original bare concrete state, floor erosion has been a continuing headache. Investigation of epoxy resins led to selection of Union Carbide Plastics Co.'s Bakelite ERL-2795 used with Sonite EC, a hardener supplied by Smooth-On Mfg. Co., Jersey City, as the best performer.

TWA figures materials and labor costs for retreatment at 45 and 65¢ respectively, per square foot.



The Convair F-106 sets record as world's fastest jet aircraft...

powered by a Pratt & Whitney Aircraft J-75 jet engine

At Edwards Air Force Base on December 15, 1959, the F-106 all-weather interceptor roared to a new world speed record of 1,525.95 miles per hour. Flying a straightaway course at an altitude of 40,000 feet, it bettered the previous official world mark by 122 miles per hour.

The Air Force F-106 has also demonstrated that it has low-level striking power. At elevations of 50 to 300 feet, under most adverse conditions, the F-106 averaged 700 miles an hour in a 300-mile flight from Edwards Air Force Base.

Pratt & Whitney Aircraft's J-75 jet engine powers the F-106. With this same engine, Republic's F-105D fighter-bomber recently set a new speed record for closed-course flight. Over the years, Pratt & Whitney Aircraft J-57 and J-75 jet engines have held virtually every major flight record.

PRATT & WHITNEY AIRCRAFT

East Hartford, Connecticut

A DIVISION OF UNITED AIRCRAFT CORPORATION



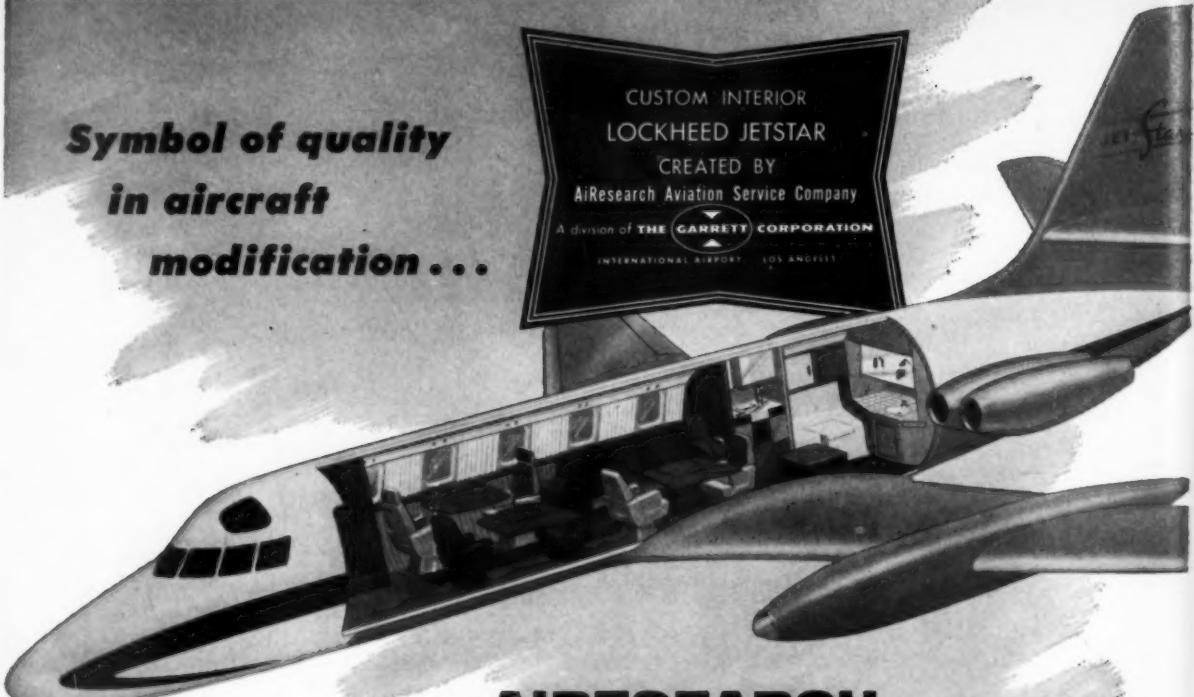
**Symbol of quality
in aircraft
modification ...**

CUSTOM INTERIOR
LOCKHEED JETSTAR

CREATED BY

AiResearch Aviation Service Company

A division of THE GARRETT CORPORATION
INTERNATIONAL AIRPORT LOS ANGELES



AIRESEARCH

**JETSTAR CUSTOM
INTERIORS**



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specialists for the individual JetStar purchaser, all furniture, galleys, lavatories and other appointments are of fully-stressed, lightweight construction.

A full-scale mock-up of the cabin is used for prefitting the custom-built furnishings to insure precision work and reduce modification time. This modification includes exterior painting of the aircraft and ducting of the AiResearch pressurization system, standard equipment on all Lockheed JetStars.

The most complete modification center of its kind, AiResearch Aviation Service employs more than 600 highly trained and experienced engineers, technicians and craftsmen using the most modern manufacturing and testing equipment in the industry.

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THE GARRETT CORPORATION

AiResearch Aviation Service Division

International Airport, Los Angeles, Calif. • Telephone: ORegon 8-6161



Automatic Life Vest

An exclusive contract for sale of a water-activated automatic inflator for life vests has been granted the Garrett Corp.'s Air Cruisers Division by the Henry Engineering Co., Burbank, Calif.

Similar in appearance to a standard CO₂ cartridge vest inflator, the Henry device is designed to operate automatically



upon water contact by means of a printed electronic circuit. It will withstand exposure to 100% humidity environment.

Although designed primarily for use in life vests, the inflator has broad application to other inflatable equipment such as life rafts, marker buoys and other items involving air drop at sea.

Write: Dept. A/L, The Garrett Corp., 9851 Sepulveda Blvd., Los Angeles 45.



Baltograph 260 portable X-ray unit is shown testing tail sections of aircraft on the Temco-Greenville flight line. Radiography detects flaws without drastic mechanical disassembly. Platform on lift truck forks was specially designed for use

with the Baltograph unit. Manufacturer of the Baltograph 260 is Balteau Electric Corp., Stamford, Conn.

Utility Truck

A heavy duty utility truck made by the Cochran Equipment Company has been in use by Pan American in the Pacific for approximately one year. The carrier recently has placed orders for additional units.

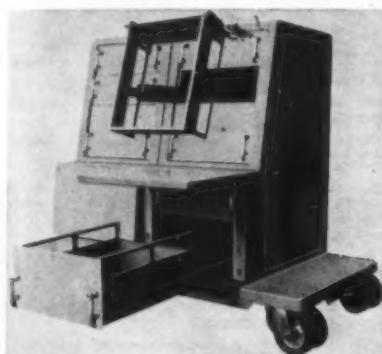
The multiple-purpose unit will handle jet engines or baggage from ground level to cabin height in the DC-8. It is built



on a Cochran frame but uses standard Ford running gear components.

Capacity is 8,000 lbs. Lift height is 160 in. maximum, 48 in. minimum. Overall length is 250 in. Width is 96 in.

Write: Dept. A/L, Cochran Equipment Co., P.O. Box 890, Salinas, Calif.

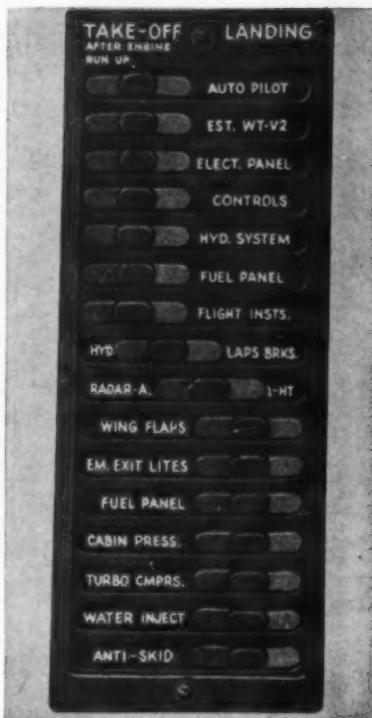


Flight line test console with multiple bays mounted on heavy duty dollies and suitable for towing over airfield paving is presented by Western Devices, Inc., 600 W. Florence Ave., Inglewood, Calif. Console has swing-up work bench, is 51.3 in. high and 36 in. deep.

Check List

An illuminated check list for aircraft has been devised by Plasteck, Inc. which provides an instant visual report on each item that must be checked prior to take-off or landing.

The mechanical device incorporates integrally illuminated instrument panel lighting with white characters on black by day, illuminated in red light by night.



Slide tabs may be moved to conceal each item checked and simultaneously set up the next sequence. The standard unit has 16 individual items for takeoff and landing, a total of 32. Larger and smaller units are available to suit individual requirements.

Of aluminum and acrylic plastic, units come in dull black, dull gray, plain or wrinkle finish, and special colors on request.

Write: Dept. A/L, Plasteck, Inc., Poteau, Oklahoma.



Microphone for jets is demonstrated by United Air Lines Capt. Paul Reeder. Model 603-TR is a transistorized differen-

tial dynamic microphone which will be used in United's DC-8 and Boeing 720 aircraft. It is made by Electro-Voice Corp., Buchanan, Mich., has two-stage transistor amplifier with low-noise characteristics.

Degreasing Booth

Faster cleaning of engine parts can be accomplished by airport service centers through the use of a compact degreasing booth made by the DeVilbiss Co. The



booth requires a space 3 by 3 ft. and can be used for degreasing, mist oiling, cleaning and touch-up painting.

An exhaust system carries off fumes and a recovery system assures economy of cleaning solvents. If air is insufficient, a compressor can be mounted beneath the booth. Compressor is available as an accessory, as is an air regulator with filter.

Write: Dept. A/L, The DeVilbiss Co., Toledo, Ohio.

INFO FOR THE ASKING

Hanger fire protection—New bulletin on fire extinguishing equipment for aircraft hanger protection describes on-the-spot fire control systems utilizing carbon dioxide.

Write: Dept. A/L, Carbon Division, Chemetron Corp., 840 N. Michigan Ave., Chicago, Ill.

Defruiter—Two-page bulletin describes new beacon interference eliminator designed to remove spurious signals (fruit)

from radar displays. It is applicable to civil radar-beacon systems.

Write: Dept. A/L, Lockheed Electronics Co., Plainfield, New Jersey.

Non-destructive testing—Booklet from Norelco shows portable equipment for non-destructive testing. Also included is reprint of article describing current testing methods.

Write: Dept. A/L, Philips Electronic Instruments, 750 South Fulton Ave., Mt. Vernon, New York.

T58 up-to-date—Eight-page report on progress in development of GE's T58 turboshaft helicopter engine is free for the asking. T58 is compact gas turbine used in a number of new helicopter designs.

Write: Dept. A/L, General Electric, Schenectady, N.Y.

Aviation sanitation—World Health Organization has illustrated guide to hygiene and sanitation in aviation.

Write: Dept. A/L, World Health Organization, Division of Editorial and Reference Service, Palais des Nations, Geneva, Switzerland.

Airless spray painting—Nordson system of spray painting is described in illustrated brochure.

Write: Dept. A/L, Nordson Corp., Amherst, Ohio.

Constant speed drives—New Vickers bulletin describes split system constant speed drives for aircraft. Ask for Bulletin A-5246.

Write: Dept. A/L, Vickers, Inc., Detroit 32, Michigan.

Voice monitor—Twelve-page catalog gives details on Honeywell's 19-channel MultiTraK voice monitor system for air traffic control.

Write: Dept. A/L, Minneapolis-Honeywell Regulator Co., 10721 Hanna St., Beltsville, Md.

Aircraft polishing—Brochure describes "Whiz-Master" aircraft polishing machine, easily adaptable to transport maintenance operations.

Write: Dept. A/L, George Habian, 38 Blackburn Lane, Manhasset, New York.

Aircraft clocks—Catalog lists several models of aircraft clocks manufactured by Wakmann Watch.

Write: Dept. A/L, Wakmann Watch Co., Inc., 15 West 47th St., New York 36.

Fuel control—Booklet explains use of electronic fuel control.

Write: Dept. A/L, Texas Instruments, Inc., 4000 Lemmon Ave., Dallas, Tex.

NOTES ABOUT SUPPLIERS

- Burton-Rodgers, Inc., Cincinnati builder of jet and turboprop animated training aids, will shift its headquarters to a new 50,000 sq. ft. facility in Tulsa this fall.

- Howell Instruments, Inc. is new name for merger of B & H Instrument Co., Inc. and Howell Instrument Co., both of Fort Worth. B & H Instrument Co. was maker of the JETCAL Analyser for jet engines. Howell Instrument Co. made Ta'Pot potentiometer and a line of galvanometers.

- Brushless, high frequency generators for ground support and check-out of TWA's 880s will be produced by Inet Div. of Leach Corp. Transistorized regulators will be used to control voltage. First order is for 10.

- Two small gas turbine models made by AiResearch have been shipped to France and Germany for installation checks on new aircraft still in mockup. One is for Breguet's 1150 *Atlantique* turboprop patrol craft. The other is for joint German-French C-160 *Transall* turboprop cargo transport being built by Weser Flugzeuge and Nord.

- REF Mfg. Co. has FAA contract for a universal pump and accessories test machine. Model UPA-1 will be used to check out pumps and non-rotating components used in aircraft hydraulic, vacuum and fuel systems.

- Airwork Corp. has worked deal with Prudential Life for \$800,000 loan to finance expansion of jet engine overhaul facilities. Airwork began overhauling Rolls-Royce Dart engines early in July.

- Hi-Shear Corp. is new designation for company formerly known as Hi-Shear Rivet Tool Co. Name change paves way for projected diversification.

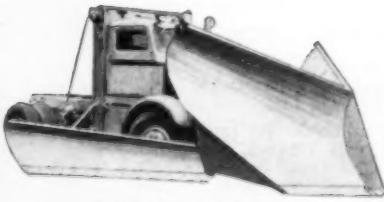
- Agricultural Aviation Engineering Co. has acquired the I.C.D. Equipment Co. I.C.D. makes rotating brush-type spray atomizers for agricultural aircraft.

- Order for aircraft seats exceeding \$1 million has been placed by United Air Lines with Aerotherm Div. of Aerotec Inc. Seats will be installed in 20 Caravelles scheduled for delivery next Spring.

A SNOW PLOW FOR EVERY SNOW REMOVAL PROBLEM



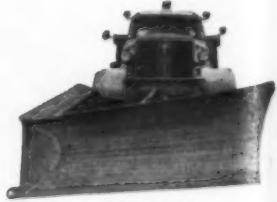
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• "V" Plows with Wings



• Straight Plows



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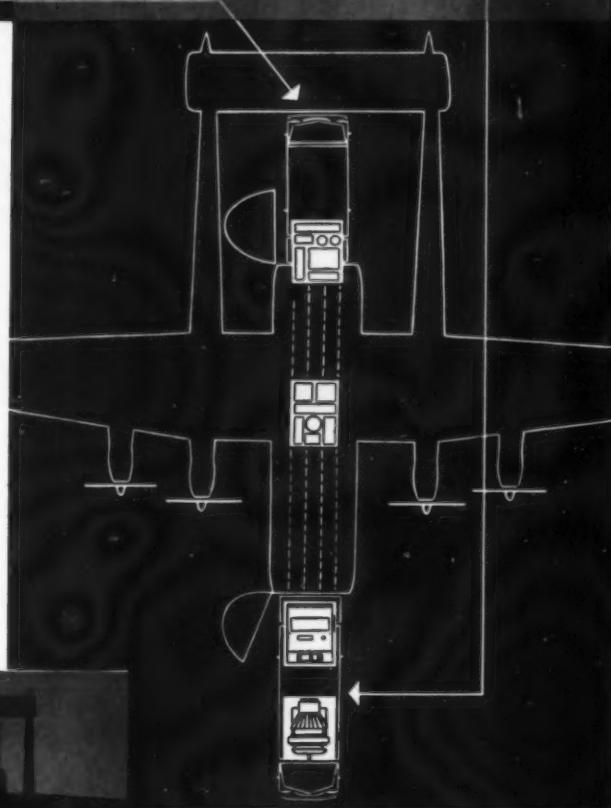
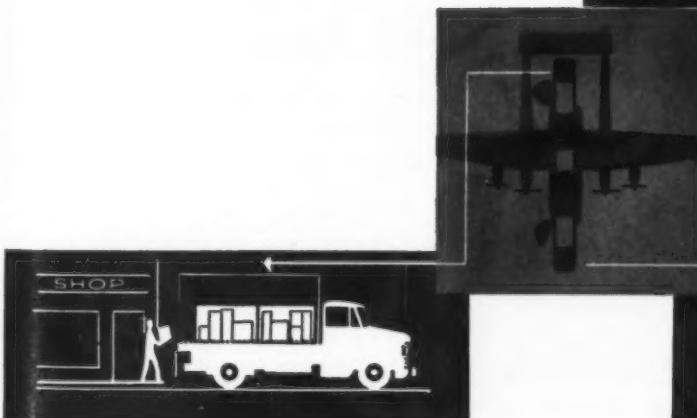
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The revolutionary Rolamat-Argosy system of unitized loading

One pallet, one waybill—one streamlined operation door to door. That's the revolutionary air freight system with the Rolamat-equipped Argosy.

Small parcels are built up on the pallet, the unitized load rolled onto a truck and straight from the truck into the Argosy.

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Rolamat saves time, saves trouble, saves money, saves labour, saves warehouse space. Yes sir, things really move with the Rolamat-Argosy system of unitized freight handling!

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CORPORATE
& PRIVATE
AIRCRAFT
EQUIPPED WITH

INSTANTANEOUS VERTICAL SPEED INDICATOR

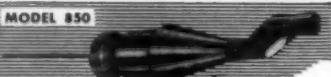
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Displayed Advertising: \$20.00 per column inch. Space units up to full pages accepted in this section for classified-type advertising.

Forms close three weeks preceding date of issue. Address all correspondence to Classified Advertising Department, Airlift Magazine, 1001 Vermont Ave., N.W., Washington 5, D.C.

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NEWS

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FPD NEWS offers latest information on openings throughout the Division to interested engineers and scientists. Technical information and news relating to current projects will also appear from time to time in this column.



Commercial Engine Programs Spotlight Opportunities in Customer Service

Flight Propulsion Division's growing commercial jet engine business is sparking expansion of dynamic Customer Support Teams.

Organized on a 1 to 1 basis for each airplane flying G.E. powered Convair 880's, a typical team consists of a key man and a factory group at the Evendale plant, and an Airline Engineering Supervisor with his field group at airlines headquarters, maintenance stations and overhaul facilities.

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Extensive Asian Journey

Winds Up in Nepal

This is the final article about the long trip of the fall of 1958 which began in the Soviet Union and Siberia and continued through Afghanistan and India to the tiny kingdom of Nepal.

Starting next issue there will be a "change of pace." More industry chit-chat, observations and comments with a completely flexible pattern.

Nepal is unquestionably the most fascinating country I've ever visited. But if you go, do some advance reading and don't dash in and out in a day.

There are more smiles per square foot than in any other country. But beneath the smiles is a very small \$40 per capita per year income and a high death rate. The average age is 24. Nepal is a Shangri-La in appearance and the people are wonderful and colorful but life has been hard—and short.

Monkeys are everywhere

Animals are everywhere, including lots of monkeys living off the land. These latter can be dangerous. Offer some food to a monkey and his response is immediate and friendly. But you're apt to be pounced on by a mob of other monkeys springing out of nowhere and if they don't share in the food, you've had it. Monkey bites can be fatal. A vicious mob attack is not uncommon for the unwary.

On the main streets there are dogs, cows, calves, bicycles, chickens and what

have you. Despite the introduction of some cars and trucks, most transportation is on foot, and most hauling is on the backs of human beings. Beware of hitting a cow—the penalty is double that for hitting, injuring or killing a human being. The cow is very sacred and has freedom to go anywhere—and I mean anywhere.

Low living standard

Indicative of the low standard of living are country people in strange costumes standing in the main avenues of commerce with loads of kindling wood on their backs. They wait patiently until somebody buys the wood (for a few cents) and then return, perhaps days away on foot, to their homes in valleys. Wood is not plentiful in the Kathmandu area.

A fascinating sight is a group of Tibetans who have brought wool or some other product from the Himalaya plateau to Kathmandu for sale to local merchants. The bargaining is fierce and may go on for hours and days. He who doesn't bargain is a fool and a sucker. Bargaining is expected from the start. The first price mentioned is anywhere from five to ten times what the final one can be. A merchant loses all interest in a sale if there isn't spirited bargaining.

There are two good times to visit Nepal—March until mid-June, and mid-September through November. Much rain comes



All photos by W.W.P.

A Tibetan couple down from the Himalaya to trade. They had crude knives for sale.

in the summer after mid-June including the six-week monsoon season starting about August 1. December through February is cold and often misty.

I have had reports that the Royal Nepal Airlines is expanding and doing well despite handicaps. When I was there they had a few DC-3s but only one was operative and a second one was being put together from the remains of several. Those cows on runways are obstacle courses and the airline had run into a few on fields around the country. The practice is to fly low over the field to scatter the animals, but sometimes the cows were back on the runways before the pilot could swing around for a landing. Both the cows and the airline lost.

Someday I hope to go back to Nepal, but maybe it will be too much of a tourist haven for it to retain its primitive out-of-this-world atmosphere. Like all other such countries, Nepal is moving up the scale economically and in political importance. It is moving rapidly from the ninth century into the seventeenth, and may even be shoved into the twentieth century.

Thanks, Nepal, for the most delightful visit I've ever had anywhere.



Daily Indian Airlines Corp. DC-3 is like old home week.

Temples by the hundreds everywhere and always plenty of happy kids.



No show windows needed on Kathmandu's main shopping street.

Bolts of cloth on a temple's steps, the other goods on the ground.



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Designed by
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Crosley creates new aerial highways

Stacked aircraft in the skies over the nation's busy airports may soon become a problem of the past. Avco's Crosley Division, working with the U.S. Air Force's Cambridge Research Center, has developed a new, improved system for directing high-density air traffic accurately and reliably.

This unique solution to the air traffic control problem is *Volscan*, a ground-operated electronic system that employs surveillance radar and vectoring techniques in scheduling aircraft to touchdown. It can work at any airport, with any aircraft carrying a two-way radio.

With *Volscan*, a crowd of randomly arriving aircraft can be converted into an orderly, safe procession. Not only does *Volscan* enhance safety in the air, but it greatly increases the traffic-handling capability of any airport. The flight of as many as 24 aircraft can be directed at one time with *Volscan* and up to 120 landings and take-offs—one every 30 seconds—can be made in an hour.

Volscan has undergone complete systems testing, and is about to be installed at Atlantic City for careful and extensive field testing under direction of the Federal Aviation Agency and the U.S. Air Force.

*For further information on Volscan write:
Director of Marketing, Crosley Division,
Avco Corporation, Cincinnati 25, Ohio.*

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